GENERAL CONSTRUCTION REQUIREMENTS

As a minimum standard for populations of a low security level the institution General Housing Unit outer walls/roofs/floors shall be a Type B construction as referenced within the following document entitled "Secure Construction Requirements."

SECTION 01000 - SECURE CONSTRUCTION REQUIREMENTS

GENERAL DESIGN REQUIREMENTS

A. RELATED DOCUMENTS

1. Section 01001 - GENERAL CONSTRUCTION REQUIREMENTS.

B. SECURITY ENCLOSURES

1. TYPE A AND TYPE B CLASSIFICATIONS: This section describes the construction materials and assemblies required for secure construction. The Federal Bureau of Prisons utilizes two types of security enclosures, type "A" and type "B." The Secure Construction Requirements Matrix at the end of this section defines the areas where type "A" and type "B" enclosures are required.

2. SUBSTANTIAL CONSTRUCTION: In addition to type A and type B secure construction as described above, FBOP utilizes a Substantial Construction classification for some security wall enclosures. Areas requiring substantial construction are listed in the Secure Construction Requirements Matrix.

C. ACCEPTABLE MATERIALS AND METHODS FOR SECURE CONSTRUCTION: (Reinforcement sizes listed below are to meet minimum requirements for secure construction. Additional reinforcement may be needed to meet structural requirements.)

1. WALLS

a. Type "A" walls shall be constructed using one the of the following methods:

(1) Concrete masonry construction shall be minimum nominal 200 mm (8") units reinforced with No. 13 metric (#4) rebar @ 200 mm (8") o.c. each way with all cells fully grouted with 21 MPa (3000 psi) grout.

(2) Precast concrete for secure wall construction shall be minimum 100 mm (4") thick and have a minimum strength of 35 MPa (5000 psi) reinforced with MW26 (W4) welded wire fabric (minimum), at 100 mm (4") o.c. in both directions, conforming to ASTM A 185.

(3) Cast in place concrete for secure wall construction shall be minimum 150 mm (6") thick and have a minimum strength of 21 MPa (3000 psi) reinforced with No. 13 metric (#4) rebar @ 200 mm (8") o.c. each way or MW65 (W10) welded wire fabric at 100 mm (4") o.c. in both directions. Concrete strength of 28

MPa (4000 psi) shall be reinforced with No. 13 metric (#4) rebar @ 200 mm (8") o.c. each way or MW45 (W7) welded wire fabric at 100 mm (4") o.c. Cast in place concrete which is less than 150mm (6") thick (but no less than 100 mm (4") thick) shall have a minimum strength of 35 MPa (5000 psi) reinforced with MW26 (W4) welded wire fabric (minimum), at 100 mm (4") o.c. in both directions.

(4) Tunnel form construction which meets the minimum concrete strength and reinforcement requirements above will be acceptable.

b. Type "B" walls shall be constructed using one the of the following methods:

(1) Concrete masonry walls shall be constructed as described for type "A" except only vertical reinforcement #13 metric (#4) rebar @ 200 mm (8") o.c. shall be required.

(2) Concrete construction utilizing welded wire fabric as described for type "A" is also acceptable for type "B" construction.

(3) Concrete construction utilizing rebar as described for type "A" above shall have minimum reinforcement of #13 metric (#4) rebar @ 200 mm o.c. in one direction.

c. Substantial Construction shall be constructed as follows:

(1) Substantial Construction shall be a standard construction CMU wall of a minimum nominal thickness of 200 mm (8") or any precast or cast in place concrete. Walls of substantial construction extend to roof structure, or to steel or concrete ceiling structure.

d Additional requirements for all secure walls:

(1) Security walls must be constructed continuously from a security floor to a secure ceiling. The secure ceiling may be either a secure roof deck or a cap of secure construction built below the roof deck in high bay areas. The continuity of the secure wall construction must be maintained by tying the wall reinforcing into the secure floor and ceiling construction.

e. Special Note on Walls:

(1) In some instances walls/cells may be made of steel. Steel walls/cells are used where existing structures will not support concrete or masonry walls. Written approval must be obtained from the Project Manager to use steel walls/cells.

2. ROOF/CEILING CONSTRUCTION

a. Type "A" roof/ceiling construction shall be constructed of the following:

(1) Cast-In-Place Concrete slab shall be 150 mm (6") thick. 21 MPA (3000 psi) concrete with No. 13 metric (#4) bars at 200 mm (8") o.c. each way or MW65 (W10) welded wire fabric at 100 mm (4") o.c. in both directions. Concrete strength of 27 MPa (4000 psi) shall be reinforced with No. 13 metric (#4) rebar @ 200 mm (8") o.c. each way or MW45 (W7) welded wire fabric at 100 mm (4") o.c. Cast in place concrete which is less than 150mm (6") thick (but no less than 100mm (4") thick) shall have a minimum strength of 35 MPa (5000 psi) reinforced with MW26 (W4) welded wire fabric (minimum), at 100 mm (4") o.c. in both directions.

(2) Composite Metal Deck shall be a minimum 100 mm thick, 21 MPA (3000 psi) concrete, No. 13 metric (#4) bars at 200 mm (8") o.c. each way or MW65 (W10) welded wire fabric at 100 mm (4") o.c. in both directions. Concrete strength of 28 MPa (4000 psi) shall be reinforced with No. 13 metric (#4) rebar @ 200 mm (8") o.c. each way or MW45 (W7) welded wire fabric at 100 mm (4") o.c. in both directions. MW26 (W4) welded wire (minimum), at 100 mm (4") o.c. in both directions, may be used with 35 MPA (5000 psi) concrete.

(3) Prestressed Tees or Hollow Core slabs shall have a concrete topping to give adequate cover for No. 13 metric (#4) bars at 200 mm (8") o.c. or MW65 (W10) welded wire fabric at 100 mm (4") o.c. in both directions.

(4) Solid concrete plank shall have No. 13 metric (#4) bars at 200 mm (8") o.c. each way or MW65 (W10) welded wire fabric at 100 mm (4") o.c. in both directions no concrete topping is required.

b. Type "B" roof/ceiling construction shall be constructed of the following:

(1) Cast-In-Place Concrete slab shall be a minimum of 150 mm (6") thick, 21 MPA (3000 psi) concrete with No. 13 metric (#4) bars at 200 mm (8") o.c. in one direction.

(2) Composite Metal Deck shall be a minimum 100 mm thick, 21 MPA (3000 psi) concrete, No. 13 metric (#4) bars 200 mm (8") o.c. in one direction.

(3) Prestressed Tees or Hollow Core slabs shall have a concrete topping to give adequate cover for No. 13 metric (#4) bars 200 mm (8") o.c. in one direction.

(4) Solid concrete plank shall have No. 13 metric (#4) bars at 200 mm (8") o.c. in one direction. No concrete topping is required
(5) Metal Roof Decks shall be a minimum of 12 ga deck. No additional reinforcing is required, however the deck must be securely tied to the "B" security walls.
(6) Concrete construction utilizing welded wire fabric as described for type "A" is also acceptable for type "B" construction.

3. FLOORS and CRAWL SPACES

a. Floors and crawl spaces construction are required to be the same as roof/ceiling construction. Access to crawl spaces will be through a secure access point. These will usually be mechanical and electrical spaces. The locations shall be submitted for review by FBOP.

D. INTERSECTIONS OF HORIZONTAL AND VERTICAL SURFACES:

1. Continuity of materials is preferred to facilitate a continuous security enclosure. Where dissimilar materials occur, provide sufficient connections to prevent deflection of materials; or continuously weld deck to a continuous steel member anchored to wall or foundation.

2. Security bars must be continuous at all intersections. In other words the bars must go around the corners and continue into adjacent slabs or secure ceiling construction. These requirements must be coordinated with masonry horizontal reinforcing, and dissimilar concrete materials; i.e., masonry and cast in place.

E. PENETRATIONS

1. Security barriers are required on all penetrations in secure walls, floors and ceilings where the opening is larger than 200mm x 200mm (8" x 8") or larger than a 125mm (5") slit. Security barriers are required on all penetrations 125 mm (5") wide which exceed 600mm (24") in length.

2. Security barriers shall be constructed of 22 mm (7/8") diameter round bars. Space between bars shall not exceed 125 mm (5"). Bars longer than 600 mm (24") shall be reinforced with an intermediate flat bar, 60 mm x 10 mm nominal (2 ½" x 3/8"), welded to the barrier frame and tack welded to each bar. The flat stock is installed perpendicular to the bars and at the mid point of the bars to prevent spreading.

3. Security barriers for mechanical penetrations are detailed in Division 15.

4. In some designs, due to the requirement to put security barriers on large exterior wall louvers, it may be more economical to put mechanical rooms outside the security envelope.

MATRIX OF OPENINGS WITH SECURITY BARRIER REQUIREMENTS:

inches		4"	5"	6"	8"	>8"	10"	12"	24"	>24"
	mm	100	125	150	200	>200	250	300	600	>600
4"	100	-	-	-	-	-	-	-	-	-
5"	125	-	-	-	-	-	-	-	-	BAR
>5"	>150	-	-	-	-	BAR	BAR	BAR	BAR	BAR
8"	200	-	-	-	-	BAR	BAR	BAR	BAR	BAR
>8"	>200	-	-	BAR	BAR	BAR	BAR	BAR	BAR	BAR

END OF SECTION

SECURITY DOOR AND HARDWARE REQUIREMENTS

As a minimum standard for populations of low security levels and above:

All doors , frames and locks located in the outer walls of housing units shall be detention grade per the attached BOP standards (11191 & 11197). At a minium, hollow metal doors and frames are to be 12 gauge steel and locks are to be 6 lever, series 80 paracentric deadbolt.

Access door located in the outer walls or roof shall be security grade per the attached BOP standards (11199).

SECTION 11191 - SECURITY METAL DOORS AND FRAMES

GENERAL

A. The work provided on this Project consists of security metal doors, frames, and related items necessary to complete the work indicated on the drawings and described in these specifications. Include transoms, sidelights, borrowed lights, and similar formed hollow metal work indicated in secure areas. Work shall also include the following items:

1. Embedded items, such as weld plates and embedded subframes.

2. Hardware enclosures interconnected with conduit, elbows, and connectors where electrically operated hardware is required.

B Provide materials meeting the following criteria:

1. ASTM A366M-91 — Specification for Steel, Sheet, Carbon, Cold-Rolled, Commercial Quality.

2. ASTM A627 — Standard Specification for Homogeneous Tool-Resisting Steel Bars for Security Applications.

3. ASTM B117-94 — Standard Test Method of Salt Spray (Fog) Testing.

4. ASTM D1735-92 — Standard Practice for Testing Water Resistance of Coatings Using Water Fog Apparatus.

5. AWS D1.1 — Structural Welding Code: Steel.

6. HMMA 862-87 — Guide Specifications for Commercial Security Hollow Metal Doors and Frames

7. HMMA 863-98 — Guide Specifications for Detention Security Hollow Metal Doors and Frames

C It is desired that the detention equipment subcontractor shall provide a "turnkey" package with a single source of responsibility for the following sections:

1. Security Metal Doors and Frames
2. Detention Hardware
3. Security Glazing

4. Detention Equipment
5. Security Fasteners
6. Security Access Doors

D. DETENTION EQUIPMENT SUBCONTRACTORS

1. Service: The detention equipment subcontractor shall employ a factory-trained and factory-approved service organization. This organization shall have experience in servicing and maintaining this equipment.

2. Service organization shall submit a proposal to the Contracting Officer for service after the warranty period.

E. CERTIFICATION: Security hollow metal manufacturers shall submit to the Contracting Officer test reports and documentation by an independent testing laboratory in accordance with ASTM F 1450 certifying compliance with HMMA 863 Section 1.06. Security grades and test load requirements shall comply with HMMA 863-98, Section 1.06, Table 1 grades 1 and 3. Required tests include:

1. Door Assembly Impact Test
2. Door Static Load Test
3. Door Rack Test
4. Door Edge Crush Test
5. Bullet Resistance Test
6. Removable Glazing Stop Test

F. Labeled Doors and Frames: Where required by the project, furnish doors and frames bearing the label of Underwriters Laboratories or Factory Mutual Engineering Corporation, indicating the applicable rating and wall opening classification specified.

G. Provide factory-trained representatives to demonstrate equipment and instruct Contracting Officer's designated personnel in operation, repair, and maintenance of security doors and frames.

H. WARRANTY: The subcontractor shall warrant his material and workmanship on this project for a period of 1 year from the date of Substantial Completion. The subcontractor agrees to repair or replace any defective materials; and to correct any defective security work, when given written notice by the Contracting Officer during this warranty period. The subcontractor also agrees to respond to these notices within 5 calendar days and make all repairs as required for proper operation during this warranty period.

I. Doors shall be shipped to prevent damage. Frames shall be shipped with angle spreaders at door opening bottoms. Doors and frames shall be stored on the building site in an upright position, under cover, on wood sills or floors in a manner that prevents rust or damage. Ventilate canvas or plastic covers to prevent moisture traps.

PRODUCTS

A. Provide products meeting the following criteria.

B. Embedded items shall be mild steel shapes and plate and, where required, shall be 5 mm or 6 mm thick, and shall comply with ASTM A366.

C. SECURITY-TYPE HOLLOW METAL DOORS

1. Security-type hollow metal doors shall have a thickness of 50 mm (2") (actual). Doors shall have 3 mm side clearance with proper bevel to operate without binding. Furnish all accessory items as required for a complete installation.

2. Doors shall be custom-made, of the types and sizes shown on approved shop drawings, and shall be prepared for hardware in accordance with the manufacturer's recommendation and the final approved Security Hardware Schedule. Doors shall be constructed using commercial-quality cold-rolled steel that complies with ASTM A366. The steel used shall be free from scale, pitting, coil breaks, or other surface blemishes. The steel shall also be free of buckles, waves, or any other defects caused by the use of improperly leveled sheets. Door face sheet thicknesses shall be 12 gauge.

3. Door edge seams shall be continuously welded and finished smooth such that there are no visible seams. Doors shall be strong, rigid, and neat in appearance, free from warpage or buckle. Edge bends shall be true and straight and of minimum radius for the thickness of metal used.

4. Doors shall be stiffened by continuous vertically formed steel sections that, upon assembly, shall span the full thickness of the interior space between door faces. These stiffeners shall be 16 gauge minimum thickness, spaced such that the vertical interior webs shall be no more than 100 mm o.c. and securely fastened to both face sheets by spot welds spaced a maximum of 60 mm o.c. vertically. Spaces between stiffeners shall be filled with 48 kg per cubic meter fiberglass or mineral rock wool batt-type material. If the manufacturer must use heavier materials and/or closer stiffener and weld spacings to meet the performance criteria set forth in Subparagraph 1.4 F,

"Certification," of this section, he must use them in the door construction for this project. Door construction details must be submitted for approval as part of the submittal drawings.

5. Stiffeners thinner than 16 gauge (but not less than 28 gauge) may be used when the door is constructed utilizing a truss design core material which utilizes truncated triangular sections extending continuously from one door face to the other. Welds in a truss section must be spaced at a maximum of 75 mm (3 in) o.c. vertically and 70 mm (2-3/4 in) horizontally. Core material must extend to the full height and width of the door. Manufacturers utilizing truss stiffeners must meet the performance criteria set forth in this specification. Spaces between stiffeners shall be filled with 48 kg per cubic meter (3 pounds per cubic foot) fiberglass or mineral rock wool batt-type material.

6. Vertical edges shall be reinforced by a continuous steel channel, not less than 10 gauge thick, extending the full length of the door. Channel that is broken at the hinge mortises shall not be acceptable. Noncontinuous channel at lock edge shall be acceptable only to accommodate lock preparation. In these cases, hardware reinforcements shall be welded to the channel such that they become an integral part of the channel. The top and bottom edges shall be closed with a continuous channel, also not less than 10 gauge spot-welded to both face sheets a maximum of 75 mm o.c. The 10 gauge closing channels shall be reinforced with a full width of 5 mm plate and continuously welded to the vertical edge of the door at all four corners.

7. Top and bottom channel shall be fitted with an additional flush closer plate of not less than 12 gauge. The flush closing plate shall be welded in place at the corners and 60 mm long welds 300 mm o.c. Installation of closer plate using screws, security or otherwise, shall be deemed unacceptable. The end channel and flush closer plate shall be installed such that they are permanent and nonremovable.

8. Edge profiles shall be provided on both vertical edges of door as follows:

   a. Single-Acting Doors: Beveled 3 mm in 50 mm.
   b. Horizontal tract doors on equivalent square profiles.

D HARDWARE REINFORCEMENTS

1. Doors shall be mortised, reinforced, drilled, and tapped at the factory for completely templated, mortised hardware in accordance with the final approved hardware schedule and templates provided by the hardware

supplier. Where surface-mounted hardware is to be applied, door shall be reinforced, drilled, and tapped in accordance with final approved hardware schedules and templates.

2. Minimum thicknesses for hardware reinforcements shall be as follows:

   a. Full mortised hinges and pivots: 4.5 mm.
   b. Surface-applied maximum security: 6 mm plate.
   c. Reinforcements for lock fronts, concealed holders, or surface: 4.5 mm.
   d. Mounted closures: 4.5 mm.
   e. Internal reinforcements for all other surface-applied hardware: 4.5 mm.

3. Hinge and pivot reinforcement shall consist of an 200 mm long, pressed formed, 4.5 mm angle that is projection-welded in six places to the face of the doors, and additionally plug-welded at each end to the opposite door face sheet, forming a rigid structural angle reinforcement at each hinge. Flat or offset strap reinforcements that are welded to the inside edge of the door or to perimeter channel shall be unacceptable. Reinforcements for mortised hardware occurring in the edge of the door shall be securely welded to the inside of both face sheets of the door.

4. Doors containing manual prison locks (80 series) will be flush-mounted with the face sheets of the door (refer to detail).

5. Doors that require additional hardware (e.g., food pass openings, locks, and hinges) will be as shown on detail.

6. All detention grade hollow metal doors 900 mm or greater in width shall be hung using 4 hinges.

E. GLASS MOLDINGS AND STOPS

1. Doors shall be provided with steel moldings to secure glazing in accordance with glass sizes and thicknesses shown with a minimum 25 mm glass engagement.

2. Fixed glass molding shall be not less than 2.5 mm, and shall be spot-welded on the secure side a minimum of 75 mm o.c.

3. Removable glass stops shall be pressed steel angle not less than 3.5 mm with tight-fitting mitered corner joints, and secured with #1/4-20 Torx pinhead

screws spaced 150 mm o.c. maximum with a maximum spacing of 50 mm from the ends of the stops.

4. Where glass thickness dictates, 10 gauge, offset surface-mounted glass stops shall be used. The corners shall be tight-fitting and mitered, and the glass stop shall be secured to the face of the door using #1/4-20 Torx pinhead screws spaced 150 mm o.c. maximum with a maximum spacing of 50 mm from the ends of the stops.

5. Removable glass stops specified in paragraphs 2.3 I.3 and 2.3 I.4 shall meet performance criteria designated in the performance section of this specification.

6. Removable stops shall be on the side opposite the area of inmate confinement or where they are likely to be unsupervised.

SECURITY LOUVER DESIGN: Door face sheets shall be furnished with 25 mm wide horizontal slats of length equal to the designated louver width, and spaced 25 mm apart. The number of slats shall be determined by the designed louver height. The louvers shall be of a 12 gauge Z-type construction and weld 100 mm o.c. to the inside face sheets along the 25 mm strips between the slats. Vertical channels of 12 gauge shall be welded in place on each end of the louver slats and shall extend above and below the slats 100 mm. The Z louvers shall be continuously welded at each end to the channels. Upon completion, the louvers shall become an integral part of the internal door construction. Full width by full height face sheet louver cutouts shall be unacceptable. Louvers shall meet impact load tests as designated in the performance section of this specification.

G. FOOD PASS OPENINGS: The food pass opening shall be flush opening fabricated using 12 gauge interior channels, securely welded to the inside of both face sheets. The four corner seams shall be continuously arc-welded and dressed smooth. The finished opening shall be constructed such that it cannot be dismantled or otherwise affected by tampering or scraping.

1. Food pass shutter shall be constructed as per detail. The food pass shutter shall be furnished with continuous stainless steel piano hinges, similar to a #12 deadbolt type locking device as specified in 11197 - DETENTION HARDWARE.

2. Shutters shall be chemically treated for maximum paint adhesion and given a shop coat of rust-inhibitive primer.

H. SPEAKING DEVICES: The speaking device shall consist of a rectangular pattern

of round holes, no more than 6 mm diameter, in both face sheets directly across from each other. The minimum size of the rectangular hole pattern shall be 25 mm high x 100 mm wide with a minimum of two rows of holes spaced no more than 25 mm o.c. The interior of the door between the hole patterns shall be baffled using pressed steel sections, minimum 2 mm thick such that no objects can be passed through.

I. FINISH: After fabrication, tool marks and surface blemishes shall be filled and sanded as required to make both faces and both vertical edges smooth and free from irregularities. After appropriate preparation, exposed surfaces shall receive two shop coats of a rust-inhibitive primer that meets or exceeds ASTM B117 salt spray for 150 hours and ASTM D1735 water fog test for organic coatings for 200 hours, and that is fully cured prior to shipment.

J. Door manufacturer shall provide drilled and tapped holes for all surface-applied hardware according to approved templates.

K. SECURITY HOLLOW METAL FRAMES

1. Frames shall be constructed of commercial-quality cold-rolled steel that complies with ASTM A366. The steel shall be free of scale, pitting, coil breaks, or other surface defects. Metal thicknesses shall be 12 gauge.

2. Frames shall be custom-made welded units of the sizes and types shown on approved shop drawings. Finished work shall be strong and rigid, neat in appearance, square, and free of defects, warps, or buckles. Pressed steel members shall be straight and of uniform profile throughout their lengths.

3. Corner joints shall have contact edges closed tight with faces mitered and stops either butted or mitered. Corner joints shall be continuously welded, and the use of gussets or splice plates will be unacceptable.

4. Stops: Minimum depth of stops in door opening shall be 15 mm except at electric locks; the minimum depth of the stop on the lock side of the jamb shall be 25 mm in lieu of the 15 mm. For glass and panel openings, stops shall be 25 mm minimum glass or panel engagement, or as approved by the security glazing manufacturer, to include rabbeted depth of stops.

5. Loose Glazing Stops:

   a. Pressed steel angle glazing stops shall be no less than 3.5 mm. Angle stops shall be mitered and tight-fitting at the corner joints.
   b. There shall be a 5 mm x 62 mm continuous backup plate spot-welded

under the frame where loose glazing stops are to be attached.

c. The frame under the glazing stops and the inside of the glazing stop shall be chemically treated for maximum paint adhesion and painted with a rust-inhibitive primer prior to installation in the frame.

d. Stops shall be secured with Torx-head tamperproof machine fasteners where security glazing is scheduled. Screws shall be 6 mm -20 x proper length. Locate fasteners not more than 50 mm from each end of glazing stop nor more than 150 mm o.c.

e. Removable stops shall be on the side opposite the area of inmate confinement or where they are likely to be unsupervised.

6. Frames for multiple openings shall have mullion members that, after fabrication, are closed tubular shaped conforming to profiles shown and having no visible seams or joints. Joints between faces of abutted members shall be continuously welded and finished smooth. Joints between stops of abutted members shall be welded along the depth of the stop and left neat and uniform in appearance.

7. Hardware Reinforcements and Preparation: Frames shall be mortised, reinforced, drilled, and tapped for all templated mortised hardware in accordance with the final approved Security Hardware Schedule and templates provided by the hardware supplier. Where surface-mounted hardware is to be applied, frames shall be reinforced, drilled, and tapped in accordance with final approved hardware schedules and templates. Minimum thicknesses of hardware reinforcing plates shall be as follows:

a. Hinge and pivot reinforcements — 6 mm x 250 mm steel plate.
b. Strike reinforcements — 4.5 mm.
c. Closer reinforcements — 4.5 mm.
d. Flush bolt reinforcements — 4.5 mm.
e. Reinforcements for surface-applied hardware — 4.5 mm.
f. Frame reinforcements for glazing stops — 25 mm x 3.5 mm continuous around entire opening.

(1) Hinge and pivot reinforcements shall consist of 6 mm x 37 mm long straps projection-welded in a triangle pattern in three places at each end. The strap shall be additionally reinforced by a 2.5 mm thick by 50 mm side angle welded in two places on the strap reinforcement and two places to the inside face of the frame.

(2) Where electrically operated hardware is required, hardware enclosures shall be provided. Lock pocket shall be 2.5 mm thick steel welded all sides. An additional 5 mm steel backup

plate shall be spot-welded in the lock pocket to attach the lock to. Provide 5 mm steel lock pocket cover plate deburred. Surface-mount with ¼-20 twist-off head security screws, with a minimum of eight (8) screws. These screws shall be equally spaced around the cover plate. Frame manufacturer shall install electrical conduit within the hollow metal door frame as required for specific electromechanical locks and door position switches. Minimum size of conduit shall be 20 mm or as specified. Termination of conduit shall be within lock pocket or recessed motor boxes.

8. Floor anchors with two holes for fasteners shall be fastened inside jambs with at least four spot welds per anchor. Where so scheduled, adjustable floor anchors providing not less than 50 mm height adjustment shall be fastened in place with at least four spot welds per anchor. Thickness of floor anchors shall be 4.5 mm steel.

9. Frames shall have adjustable 6 mm pencil rod anchors for setting into masonry partitions or other appropriate anchors for conditions as shown. Provide other types of anchors when required for labeled conditions.

10. Plaster guards made from no less than 0.4 mm thick steel shall be welded in place at hardware mortises on frames to be set in masonry or concrete openings.

11. Frames shall be provided with two temporary steel spreaders welded to the feet of jambs to serve as bracing during shipping, handling, and installation.

12. When shipping limitations so dictate, fabricate frames for large openings in sections designated for splicing in the field by others. Where splicing is necessary, install angle splices at the corners of the profile and extend at least 100 mm on either side of the joint. Splicing angles shall be the same gauge thickness as the frame.

13. Prepare frame for silencers. Provide three single silencers for single doors on strike side and two single silencers on frame head at double doors without mullions.

14. Finish: After fabrication, all tool marks and surface imperfections shall be removed, and exposed faces of all welded joints shall be dressed smooth. Frames shall be chemically treated to ensure maximum paint adhesion and shall be coated on all accessible surfaces with a rust-inhibitive primer that meets or exceeds ASTM B117-90 salt spray for 150 hours and ASTM D1735-

62 water fog test for organic coatings for 200 hours. Paint shall be fully cured prior to shipment. Exterior frames shall be galvanized and primed.

L. ROUND BARS AT SECURITY METAL FRAMES

Construct round bars of 25 mm diameter, tool-resisting steel meeting the requirements of ASTM A627, spaced on 150 mm centers. Project bars into frames 25 mm and weld bars to frame from back side of frames.

M. STEEL GRATING

General: At points where steel grating partitions, cell fronts, and doors are indicated on the drawings, they shall be constructed of the quality, sizes, and shapes of the members specified herein. Vertical ribbed bars shall pass through and positively interlock at each intersection with horizontal flat bars without reducing the diameter of the vertical bars. Pipe sleeves, swedging, caulking, or other interlocks that are not positive, or dependent on friction for security, are unacceptable for this work. Provide vertical flat bar framing members of the same size and material quality specified for horizontal bars. Connections of grating partitions to adjacent walls, floors, and ceilings shall be in compliance with details shown on the drawings.

N. SEMI-TOOL-RESISTING GRATING PARTITIONS

1. Grating partitions and cell fronts are to be constructed in sections, or panels, of proper width, comprised of 22 mm diameter homogeneous, tool-resisting, double-ribbed vertical bars, complying with ASTM A627, spaced not to exceed 100 mm o.c. Intermediate horizontal flat bars and framing members shall be 56 mm x 10 mm mild steel, with horizontals spaced not to exceed 300 mm o.c.

2. Top horizontal flat bar shall be connected to vertical framing members with a 50 mm x 50 mm x 6 mm angle knee securely shop plug-welded in place.

3. Intermediate horizontal flat bar intersections with vertical framing members shall be secured permanently in place by 5 mm shop fillet welds.

4. Vertical double-ribbed bars shall be securely welded in place at both the top and bottom flat bar framing members.

O. GRATING DOORS

1. When grating doors are required in grating partitions, they shall be constructed of the same materials as the partitions of which they are a part.

2. Grating doors shall be shop-prepared to receive hardware as specified. Sliding grating doors shall have provisions for hanger, guide, and strike shop-applied.

3. Food openings shall be provided in grating doors where indicated on the door schedule. Opening in grating shall be approximately 375 mm wide x 115 mm high, framed at the top with a flat bar same as intermediate horizontal bars. Provide a 6 mm thick steel plate shelf, approximately 125 mm wide x 350 mm long, at the bottom of the food openings.

P. LABORATORY TESTS: Provide reports of tests conducted on 22 mm diameter tool-resisting, double-ribbed bars used in this construction, certifying compliance with ASTM A627.

EXECUTION

A. INSTALLATION

1. Installation shall be in accordance with shop drawings and shall be accomplished by skilled workmen. Welding shall be done as indicated in accordance with American Welding Society Publication D1.1.

2. Install frames plumb, square, straight, true, rigidly secured in place, and properly braced. Anchor frames securely to floor and at jambs. Weld field joints, grind smooth, and fill with body putty to completely conceal seams, including those at transom paneling, and to form a smooth, unbroken, finished surface. Frames shall be grout-filled with a minimum of 25 MPa pea gravel concrete. Install miscellaneous items as shown.

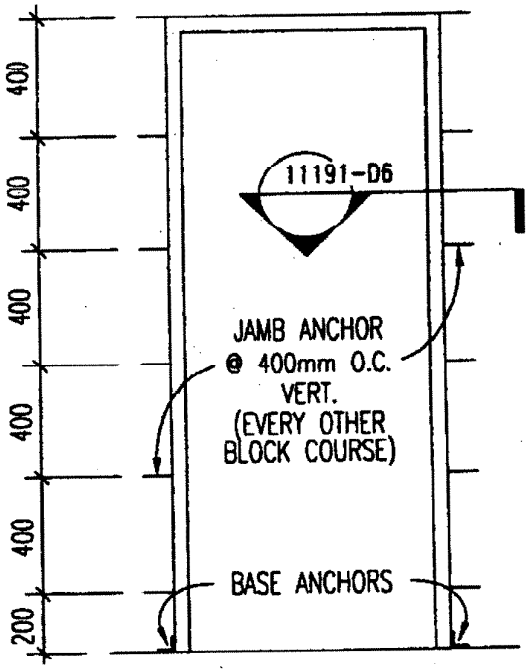
3. For hardware requirements in secure areas coordinate with the 01000 - SECURE CONSTRUCTION REQUIREMENTS and 11197 - DETENTION HARDWARE.

4. The following standard drawings and/or details are provided as examples of how the requirements for this section can be met. These or other drawings approved by FBOP shall be included in the contract documents for the project.

SCHEDULE OF DRAWINGS

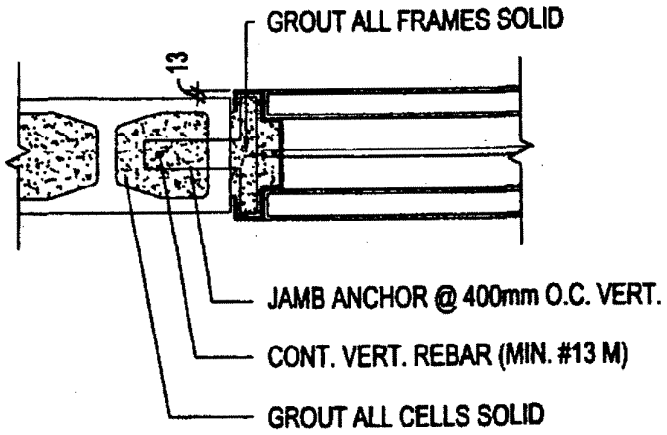
11191 - D5 TYPICAL HOLLOW METAL FRAME ELEVATION
11191 - D6 TYPICAL FRAME ANCHORING DETAIL
11191 - D7 JAMB DETAIL
11191 - D24 JAMB DETAIL - PRE-CAST / CAST IN PLACE

END OF SECTION



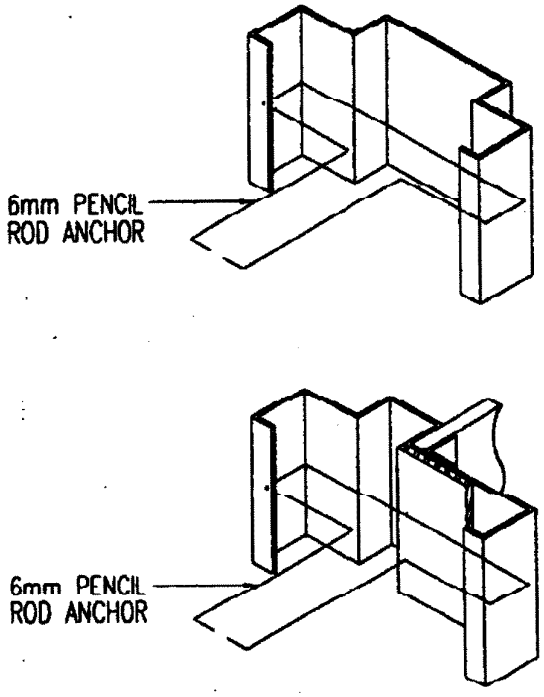
TYPICAL HOLLOW METAL FRAME ELEVATION

N.T.S



TYPICAL FRAME ANCHORING DETAIL

N.T.S.



JAMB ANCHOR DETAIL

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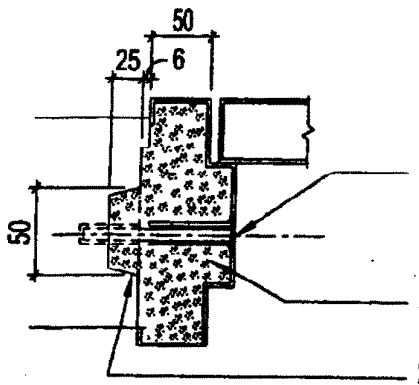
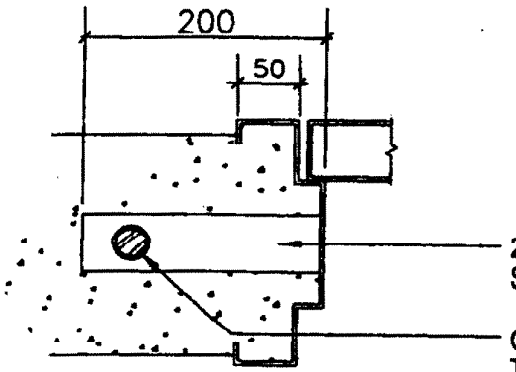


JAMB DETAIL /PRE-CAST INSTALLATION

N.T.S.



JAMB DETAIL - CAST-IN-PLACE INSTALLATION

N.T.S.

DETENTION HARDWARE

DESCRIPTION

A. Work under this section includes labor, materials, equipment, transportation, and services necessary to furnish and install detention hardware and door lock control systems, and shall include the following items:

1. Embedded items such as weld plates and embedded frames.
2. Detention hardware, keys, and accessories.
3. Door control relay cabinets and interconnecting wires between the controlled and monitored doors and relay cabinets.
4. Input/output terminal strips for interface to central processing equipment.

REFERENCES

A. AIA A305 — Contractor's Qualification Statement.

B. ANSI/BHMA A156 — Hardware Standards.

C. ANSI/BHMA A156.18 — Materials and Finishes.

D. AWS D1.1 — Structural Welding Code Steel.

E. HMMA 861, 862, 863 — Minimum Standards.

SUBMITTALS

A. Shop Drawings: Show quantities, types, and locations. Construction shall be fully detailed, showing weights of material, finish, framing, reinforcing, and anchoring of detention hardware.

B. Operation/Maintenance Manuals: Furnish two (2) copies of parts catalog, maintenance, and operating manuals for detention hardware and door lock control system. These manuals shall be precisely expressed, clear, and specific.

C. Templates: Promptly provide the hardware manufacturer's templates to the metal door and frame manufacturer.

D. Submit operating and maintenance data:

1. Wiring Diagrams: Furnish complete reproducible copies of as-installed single-line electrical wiring diagrams for gate operating systems, locking devices, and monitoring systems.

2. Maintenance manuals, including:

a. Parts list of replaceable parts, including manufacturers part numbers.
b. Lubrication requirements.
c. Complete information covering items of equipment and operation, including adjustment instructions for variable controls.

DELIVERY, STORAGE AND HANDLING

A. Delivery and Storage: Doors shall be shipped individually packed. Frames shall be shipped with angle spreaders at door opening bottoms. Store doors and frames on building site, in an upright position, under cover on wood sills or floors and in a manner that prevents rust or damage. Ventilate canvas or plastic covers to prevent moisture traps.

B. Packing and Marking: Each item of detention hardware shall be packaged and marked according to set numbers on the approved hardware schedule. Shipping cartons shall be marked "Security Hardware."

QUALITY ASSURANCE

A. Acceptable Installation: The detention equipment subcontractor will provide a "turnkey" package with a single source of responsibility for the following sections:

1. Security metal doors and frames.
2. Detention hardware.
3. Security glazing.
4. Detention equipment
5. Security fasteners.
6. Security access doors.

B. The detention equipment subcontractor shall submit qualifications of experience to the Contracting Officer, and a properly executed Contractor's Qualification Statement on AIA Document A305

C. Provide factory-trained representatives for a minimum of five (5) consecutive working days to demonstrate equipment and instruct Contracting Officer's designated personnel in operation, repair, and maintenance of detention hardware and door lock control system.

D Warranty: The subcontractor shall warrant his material and workmanship for a period of one (1) year from date of acceptance by the Contracting Officer. The subcontractor agrees to repair or replace any defective materials and to correct any defective security work when given written notice by the Contracting Officer during this warranty period. The subcontractor also agrees to respond to these notices within five (5) calendar days and make all repairs as required for proper operation during this warranty period.

EMBEDDED ITEMS

A. Embedded items shall be mild steel shapes and plate and, where required, shall be 5 mm or 6 mm, and shall comply with ASTM A366.

DETENTION HARDWARE

A. Furnish detention hardware, conduit system, wiring, and accessories for a complete security system to function properly as specified. Furnish templates of hardware if required by other contractors. Security hardware and accessories shall be furnished for a complete security system to properly function as specified. Wiring diagrams of electric locks, door position switches, and other related electrically operated equipment shall be furnished to the contractor for his use. Break-off-type fasteners shall be used for installation of all prison locks using the prison paracentric key, and for installation of the cover plates associated with these locks. After fastener head has been twisted off, grind smooth and prep for finish. Pinned Torx head screws shall be used at all other hardware installations.

B. System Description: Design electrical locks, except as noted otherwise, to retract the latchbolt by either solenoid operation for exterior doors or by motor operation for interior doors. Exterior doors are to receive galvanized locks.

1. Electric locks for swinging doors shall automatically retract the latchbolt on opening the door and automatically deadlock on closing, except for doors used for emergency egress.
2. Electric locks shall have mechanical override feature by means of a paracentric or mogul key at the door.
3. Doors with electric locks shall have a door position switch to indicate the open or closed position of the door and a heavy-duty door closer.
4. Electrical doors, door position switches, keeper switches, and locking accessories shall have color-coded wires and a set of miniature cable plug connectors.

KEYING AND KEY CONTROL

A. Locksets shall be keyed individually or keyed alike in groups or sets. Furnish six (6) each keys for locks keyed individually or groups of locks keyed alike, whichever is greater. Keys shall be stamped with respective code numbers. Keying schedule shall be provided by Federal Bureau of Prisons.

B. Delivery of Keys: Manufacturer shall tag keys according to their corresponding locks and deliver directly to the Contracting Officer or his/her authorized representative and obtain signed receipt for same.

C. Keyways assigned to this project shall be proprietary for use only by the FBOP and as approved by the Federal Bureau of Prisons' Supervisory Security Specialist.

MATERIALS (manufacturers listed are for identification purposes and do not prohibit the use of other manufacturers' products that meet or exceed these specifications).

A. Security hardware applicable for all security levels:

1. Institutional Hinge — Folger Adam #4-1/2 FM ICS, Southern Steel Co #204 FM SS (Security Hollow Metal Door Hinge):

   a. Each hinge shall be 112 mm x 112 mm (4.4" x 4.4") with 6mm (0.24") thick leaves. Hinge leaves shall be investment cast from 304 stainless steel having a tensile strength of not less than 0.089 MPa (0.01 ksi) of cross-section.
   b. Hinge pins shall be stainless steel. Hinge pin shall be fully concealed, non-removable. Hinge pins held in place with set screws are not acceptable.
   c. Entire assembly shall be cross-pinned at assembly.
   d. Hinges shall be finished US32, US32D, or USP-PRIMED, as called for in the hardware schedule.
   e. Hinges shall be mounted security-type screws with flush break-off style heads of appropriate size and length.

2. Institutional Hinge — Folger Adam #5 Southern Steel Co #205 (Grille Door Hinge):

   a. Hinge shall be heavy-duty drop-forged steel, with two concealed thrust bearings with 25 mm (1") diameter balls. Knurled, hardened hinge pin is flush-fitted to prevent tampering and machined to provide an oil hole for lubrication. Hinges feature 50 mm (2") thick drop-forged steel leaves, and shall have an overall dimension of 125 mm x 175 mm (5" x 7").
   b. Hinges shall be mounted security-type screws with flush break-off style heads of appropriate size and length.

3. Institutional Hinge — Folger Adam #3, Southern Steel Co #203 FS (Security Access Panel, Food Pass Hinge):

   a. Hinge shall be heavy-duty 10 mm (0.4") malleable iron, featuring two concealed thrust bearings. 50 mm (2") knurled and hardened pin fitted flush to prevent removal. Overall dimension shall be 75 mm x 100 mm (3" x 4").

4. Hinge — Soss #4B499-35TBB (Security Access Panel Hinge):

   a. Hinge to be wrought steel, heavy weight — ball bearing with non-removable hinge pin. Size shall be 100 mm x 90 mm (4" x 3.5").

5. Door Pull — P/P X US32D (eg., Sallyport Door):

   a. Builders brass #290-3. Back-to-back mounting when two push/pulls are specified.

6. Door Pull — Folger Adam #2, Southern Steel Co #212B (eg., Special Housing Unit Cell Doors):

   a. Material: Manganese bronze; finish shall be approximately US32D.
   b. Two (2) 10 mm — 16 mm x 20 mm oval head spanner screws furnished for attaching; attachment holes are 195 mm (7.7") center to center; overall length 215 mm (8.5"); hand hold, 112 mm (4.4")long; clearance between grip and door, 40 mm (1.6").

7. Flush Pull — Folger Adam #4, Southern Steel Co #214B (eg., Sallyport Door, Plumbing Chase Door):

   a. Material: Manganese bronze; finish shall be approximately US32D.
   b. Dimensions: 100 mm x 125 mm (4" x 5"); pocket setback, 100 mm (4").
   c. Four (4) 25 mm — 20 mm x 8 mm oval head spanner screws furnished for attaching.

8. Escutcheon — Folger Adam #1, Southern Steel Co #218-1:

   a. Material: Manganese bronze; finish shall be approximately US32D.
   b. Size: 75 mm (3") diameter, 3 mm (0.1") thick.
   c. Fasteners: Two (2) 25 mm — 20 mm x 8 mm oval head spanner screws.

9. Strike — Folger Adam #119-4BC:

   a. Material: 3 mm brass face plate with 1.6-mm thick steel back box.
   b. Attach with #12-24 x 12 mm flat head security screws.

10. Keeper — Folger Adam #80-4C, Southern Steel Co #804C:

    a. Material: 5 mm steel face plate with 1-mm thick steel back box.
    b. Attach with 25 mm x 20 x 12 mm flat head security screws.

11. Cylinder Shield — Folger Adam #2CS, Southern Steel Co #219:

    a. Made from corrosion-resistant stainless steel and aluminum, the cylinder shield is designed to protect lock cylinders on exterior doors against snow, sand, or other foreign matter. Unit includes a Folger Adam #1, Southern Steel Co #218 escutcheon.

12. Cremone Bolt Set — Folger Adam #3800HM, Southern Steel Co 10380 series:

    a. Set for each door shall consist of three-point locking by the use of head and foot bolts and a deadlock for center locking. Head and foot bolts shall be 22 mm diameter hardened steel. These bolts shall be operated by the use of lever handle. Throw for head and foot bolt shall be a minimum of 20 mm. Receptacle for foot bolt shall be self-closing.

13. Deadlock - Folger Adam #82-6/#86-6, Southern Steel Co #1080T6-1 /1080T6-2:

    a. The lock case shall be made of drop-forged steel. The lock size shall be 140 mm x 95 mm x 38 mm (5.5" x 3.7" x 1.5"). The bolt size shall be not less than 19 mm x 50 mm milled from a solid cold-finished steel bar. Slide to be integral with bolt. Each bolt to have three (3) hardened tool steel inserts not less than 6 mm diameter, inserted into blind holes from the inside of lock. Inserts shall fill holes loosely so that they will turn against action of saws. The throw bolt shall be not less than 19 mm and shall be made of proper length to come flush with door frame when retracted.
    b. The lock shall be keyed one side or two sides and shall have six (6) spring-tempered hard brass tumblers with notched ends. Each tumbler shall be activated by flat phosphor bronze spring.
    c. The lock cylinder shall be made of polished alloy bronze having both hardness and tensile strength equal to mild steel. The cylinder shall extend 12.5 mm (½") beyond case and shall be grooved to match and guide similar grooves in key.
    d. These locks must first pass the following pressure test (which is required by the Federal Bureau of Prisons before and after installation): This test (using a torque wrench and a 19 mm crow's foot) consists of applying 1.2 joules of pressure to the lock bolt in the locked position. Pressure should be applied to the center of the lock bolt and then to the top and bottom of the lock bolt. If any lock fails the test, that lock shall be replaced with a lock that does meet the required test at no cost to the Government

14. Mechanical Deadlocks — Folger Adam #12-6 and #16-6, Southern Steel Co #1010T6-1/1010T6-2:

    a. The lock case shall be made of drop-forged steel. The lock size shall be 105 mm x 75 mm x 21 mm (4.1" x 3" x 0.8"). The bolt size shall be not less than 19 mm x 38 mm milled from a high-strength bronze or hardened steel. Slide to be integral with bolt. The throw bolt shall be not less than 19 mm and shall be made of proper length to come flush with door frame when retracted.
    b. The locks shall be keyed one side or two sides and shall have six (6) spring-tempered hard brass tumblers with notched ends. Each tumbler shall be activated by flat phosphor bronze spring.
    c. The lock cylinder shall be made of polished alloy bronze having both hardness and tensile strength equal to mild steel. The cylinder shall extend 12.5 mm beyond case and shall be grooved to match and guide similar grooves in key.

15. Prison Lock — Folger Adam #32D/#36D SSCo #:1030D-1 / #1030D-2

    a. A lever tumbler deadlatch for sliding doors. Deadlocks when door is closed by key and unlocks by key. Malleable iron case and steel cover. Latchbolt (hook style) — hardened steel. Deadlock activator — solid steel. Six (6) lever tumblers made of spring-tempered brass, activated by heavy-phosphor bronze springs. Key cylinder, one piece, bronze alloy with paracentric keying. Bolt size 12.5mm thick; bolt lift 15mm. Model 32D keyed one side; Model 36D keyed two sides.

16. Lock Mount — Folger Adam #HM, Southern Steel Co #HM:

    a. Prison locks on all hollow metal doors shall be mounted with Folger Adam lock mounting HM or equal. The lock shall be factory-attached to the mounting plate with four (4) flat head spanner screws. The protruding ends of the screws shall be ground smooth and flush with the surface of the plate, which shall be made of 5 mm x 175 mm x 250 mm (0.2" x 7" x 10") hot-rolled, pickled, and oiled steel, and shall be attached to door by eight (8) 6 mm — 20 x 12.5 mm flat twist-off head security screws. Edges of plate shall be neatly and uniformly beveled. Provide a Folger Adam #1, Southern Steel Co #218-1 escutcheon. The pocket for the lock and the framing for attaching the No. HM mounting shall be provided by the door manufacturer. The mounting plate shall fit flush with the face sheet of the door. Framing shall be 3 mm thick steel channel, formed or rolled.

17. Lock Mount — Folger Adam #P, Southern Steel Co #P:

    a. Pressed and welded 5 mm steel cover plate.
    b. Attached to the gate by means of flat twist-off head security screws.
    c. Use at chain link swinging gates with manually operated locks.

d. Plates shall be galvanized finish.
e. Provide a Folger Adam #1, Southern Steel Co #218-1 escutcheon.

18. Lock Mount — Folger Adam #G, Southern Steel Co #G:

a. Pressed and welded 5 mm steel housing.
b. Attached to the grille door by welding to horizontal grating bars.
c. Cover plate 5 mm steel attached to housing by security screws.
d. Finish shall be USP or galvanized if used on exterior doors.
e. Provide a Folger Adam #1, Southern Steel Co #218-1 escutcheon.

19 Heavy-Duty Pin Tumbler Mortise Lock with Mogul Cylinder — Folger Adam #112/#116, Southern Steel Co, 10514-1/10514-2:

a. Keyed one side or two sides: knob set operates the latch bolt; deadbolt is controlled by key. Cast alloy case and cover; alloy bronze or stainless steel deadbolt with two (2) hardened steel inserts.
b. Heavy-duty mogul cylinders with five (5) stainless steel pin tumblers. Tumbler engagement by stainless steel balls; solid brass knobs and roses.

20. Door Position Switch — Folger Adam #524, Southern Steel Co #22L-4:

a. Provide, where indicated on the Security Hardware Schedule, a door position switch to provide the following function: When door is ajar or open, a circuit shall be completed (or interrupted) by the switch contained therein, said circuit to activate (or deactivate) a warning device.
b. It shall be adjustable so that, when installed, it can complete the circuit before the door is opened far enough to provide vision from the room into the corridor. Where required, it shall operate in conjunction with limit switches in an electro mechanical lock so that the warning device may be activated by either or both.
c. The case shall be formed of 3.5 mm thick steel. The top of the box shall be sloped to prevent hiding of contraband, or flat where space limitations occur. The cover shall be securely fixed in place with tamper-resistant spanner screws. The box shall be not less than 205 mm (8") long x 75 mm (3") deep x 100 mm (4") high for sloping top or 50 mm (2") high for narrow jamb style.

21. Electromechanical Locks:

a Electromechanical Motorized Lock — Folger Adam #52MCLL/#56MCLL, Southern Steel Co #1051MD-1/1051MD-2:

b. Electromechanical Solenoid Lock — Folger Adam #52ECLL/#56ECLL, Southern Steel Co #1051E-1/1051E-2:

c. Electromechanical Solenoid Lock — Folger Adam #802ESLL /#806ESLL. Southern Steel Co #1050DS-1 /1050DS-2:

d. Electromechanical Lock — Brinks #3520 (½ cycle):

e. Electromechanical Motorized Lock — Folger Adam #122MMLL/#126MMLL, Southern Steel Co #10120AM-1 /#10120AM-2:

22. Vehicle Sliding Gate Opener — Folger Adam Type "J", Southern Steel Co #9100:

a. Function: When device is in the closed position, it shall be impossible to move the gate to the open position except by electrical or mechanical operators provided. Locking to be accomplished by means of a keyless locking device engaging each gate in three places located in the locking pilaster; when gate is in the open position, all openings in the locking column shall be completely closed. Gate shall move not less than 150 mm (6") per second. Gate shall not exceed 455 kg (1003 lbs).

b. Locking Device Components and Housing: Provide supporting structure as detailed, connected with track box and housing, formed of two 200 mm (8") x 13.75# structural steel channels. Each gate to be hung on three trolley hangers. Provide 75 mm (3") I-beams across entire area of gate travel. Locking pilaster to be 100 mm (4") x 100 mm (4") x 13.0# H-beam, provided with 5mm removable cover plate, locked with Folger Adam #82-6 lock. Motor to be 1/3 HP, 208 VAC, three-phase. Motors shall be protected against overloads by thermal safety device. The gear motor will be supplied with a mechanical clutch and is adjustable to allow the device to be set to stall at a predetermined poundage to prevent damage to the electrical motor or other mechanisms when a force is applied against it. Motor Housing: Motor housing shall be nominal 4.5 mm thick sheet steel plate; weatherproof cover shall be 3.5 mm thick sheet steel. Track box and motor cover shall be hinged and fastened with security screws.

c. Controls: Gates shall be remotely controlled electrically from control center. The vehicle sallyport gates shall be interlocking so that only one gate may be opened at one time. In the event of power failure, the gate can be mechanically opened or closed by the use of paracentric key and emergency hand crank mechanism located at the pilaster at front of the leading edge of the gate.

d. Entire mechanism except the track, rollers, and drive train mechanism shall be painted with a rust-inhibitive primer.

23 Vehicle Sliding Gate Operator — Tymetal Corporation Type "PLUSS":

a. SYSTEM FUNCTION: System is designed to operate overhead chain link fence sliding gate panel. When device is in the closed position, it shall be impossible to move the gate to the open position except by electrical or mechanical operations provided. Keyless locking to be accomplished by

means of a three point mechanical locking column. Gate shall move from the completely opened position to the completely closed and locked position at a rate of 12 m (39') per minute.

b. GATE SYSTEM MOTOR: Motors shall be 1/2 HP, 208 Volt, 3 Phase by a nationally recognized manufacturer. Motors shall be protected against overload, either by thermal or a current sensing overload device. Gear Box shall be manufactured as a single unit to perform the following functions: gear reducer (self enclosed gearhead shall consist of hardened steel machine cut worm and mating bronze gear running in oil bath. Oil shall be a #5100 specialty oil with a fluid pour point of -51°C (-60°F), 5 watt heat strip included). adjustable clutching device, manual release. Controller shall house all of the required gate logic components including; relays, limit switches and motor starters with overloads. Manual operation crank handle located in the motor box shall provide a single step engagement procedure for manual operation. Fold out handle located at ground level and crank gate opened or closed. Control circuit shall be 110 VAC and operating controller shall be fabricated using U.L. listed parts. Control wiring to be supplied by 24 VAC and operating controller shall be fabricated using U.L. listed parts. Positive limits attached to the gate operator, activating a NEMA 3 or larger limit switch from full open to full close.

c. MOTOR HOUSING: Motor Housing shall be waterproof. Motor box shall be constructed of 10 gauge galvanized steel, located at ground level for maintenance. Motor box shall have detention hinges and pinned Torx security screws. Motor box shall be locked with a prison lock. Provide three (3) paracentric keys per key code.

d. SYSTEM COMPONENTS: Track shall be heavy duty overhead shall consisting of two 200 mm (8") structural steel channels joined together as shown on the drawings, weighing a minimum of 50 kg/m (33.6 lb/ft). Trolleys shall be heavy duty shall be milled from a single block of steel and use two (2) sealed ball bearings per wheel, two (2) wheels per trolley. Each gate panel to be hung on two (2) or three (3) trolleys depending on gate opening width. Fill grade beam shall consist of a 76 mm x 2.6 kg (3" x 5.7 lb) galvanized steel I-beam across the entire area of gate travel installed flush with roadway surface and be provides with welded steel guides. Vertical support posts shall consist of two (2) sets (four (4) posts) support posts, and one motor box support post, of 100 mm (4") O.D. galvanized steel weighing a minimum of 9.7 kg/m 6.5 lb/ft in accordance with ASTM F 1043. The locking column is constructed of a 100 mm x 19 kg/m (4" x 12.8 lb/ft) "H" beam width removable steel cover, secured with security screws. Three locking tangs to be affixed to the leading edge of the gate panel to provide positive locking into the locking column. Openings in the locking column shall be completely closed when the gate is in the open position. Drive chain shall be #60 roller chain in a rack and pinion system. Gate guide angle shall consist of a 64 mm x 38 mm x 6 mm (2.5" x 1.5" x 0.24") steel angle attached to the bottom of the gate panel running it's full length.

e. Submittals - Shop Drawings: Show relationship of system with other work; include details of all major components. Include parts list showing manufacturers' names and part numbers for the complete installation. Show all switches, controls, motors, and other electrical components. Include wiring diagrams of the complete system as proposed to be installed.

f. Finish:
   (1) Entire mechanism except the track, rollers, and drive train mechanism shall be painted with a rust-inhibitive primer.
   (2) Sprockets, rollers, and drive assemblies shall be electrogalvanized or nickel-plated.

g. System Test:
   (1) Preparation: Have the Company Field Advisor adjust the completed system, and then operate it long enough to ensure that it is performing properly.
   (2) Run a preliminary test for the purpose of:
      (a.) Determining whether the system is in a suitable condition to conduct the acceptance test.
      (b.) Checking and adjusting equipment.
   (3) Preparation: Notify the FBOP Project Representative at least 3 working days prior to the test so arrangements can be made to have a facility representative witness the acceptance test.
   (4) Supply all equipment necessary for system adjustment and testing.
   (5) Submit a written report of the test results signed by a Company Field Advisor and the Contractor's Representative.

h. Operation and Maintenance Data: Deliver two (2) copies, covering the installed products, to the Contracting Officer. Include name, address, and telephone number of nearest fully equipped service organization.

i. Installation: Install the equipment in accordance with the company's printed instructions unless otherwise shown.

24. Remote Controlled Sliding Door Locking Device — Folger Adam #D (High Security Corridor Doors):

a. Components and Housing:
   (1) All motors shall be 1/4 HP, 208 VAC, 60 Hz, as manufactured by a nationally recognized manufacturer. This motor shall be protected by a thermal cutout.
   (2) All roller chain drives shall be #41 size.
   (3) Hanger guides shall be 6 mm thick steel plate and shall interlock with track support with a clearance of not more than 6 mm (0.24").
   (4) Hanger support rollers shall be trimmed from solid steel 95 mm O.D. grooved 9 mm deep. Rollers shall have anti-friction ball bearings with double grease shields. Roller studs shall be high alloy treated steel with eccentric bushing for adjustment of the door.

(5) The horizontal mechanism housing shall be 5 mm mild steel plate Housing covers shall be 3.5 mm thick sheet steel with openings baffled.
(6) The vertical lock bar housing and cover shall be 4.5 mm thick sheet steel.
(7) The vertical lock bar cover shall be removable only when the horizontal cover has been removed.
(8) The emergency release cabinet shall be located at the point of the door.

b. Functions:
(1) The mechanism shall open or close a 600 mm (23.6") door in not more than five (5) seconds.
(2) Normal force exerted by a door in travel is approximately 18 kg (40 lbs). This force shall be field-adjustable by the use of a clutch.
(3) Device shall hold preset pressure on door at all times of operation regardless of voltage setting.
(4) In the event the door is blocked, the door shall automatically continue to the open or closed position when the obstruction is removed.
(5) The locking device shall be designed so that there will be no projecting lugs on the receiving column, or leading edge of door. Door shall automatically deadlock closed at two (2) points at the rear of the door. Door shall also automatically deadlock in the open position.
(6) Manual emergency locking, unlocking, and operation shall be accomplished by crank located in locking pilaster at the point of door. Cover manual release shall be secured with a Folger Adam #82-6 series lock.
(7) Maximum door weight, standard construction, is 225 kg (496 lbs). A door over 1500 mm (59") wide or heavier than 225 kg (496 lbs) can be accommodated with double roller assembly, 455 kg (1003 lbs) maximum weight.
(8) Red and green indicator lights on the control panel will indicate if the door is closed and locked (green) or in the unsecured position (red).
(9) Paint entire assembly, except track rollers and motor mechanism, with rust-inhibitive primer.

25. Remote Controlled Sliding Door Locking Device — Folger Adam #D5B (High Security Sallyport Doors and Corridors):

a. Components and Housing:
(1) All motors shall be 1/10 HP, 115 VAC, as manufactured by a nationally recognized manufacturer. This motor shall be protected by a thermal cutout.
(2) All roller chain drives shall be #41 size.
(3) Hanger guides shall be 6 mm thick steel plate and shall interlock with track support with a clearance of not more than 6 mm (0.24").

(4) Hanger support rollers shall be trimmed from solid steel 95 mm O.D. grooved 9 mm deep. Rollers shall have anti-friction ball bearings with double grease shields. Roller studs shall be high alloy treated steel with eccentric bushing for adjustment of the door.
(5) The horizontal mechanism housing shall be 9mm mild steel plate. Housing covers shall be 3.5 mm thick sheet steel with all openings baffled.
(6) The vertical lock bar housing and cover shall be 4.5 mm thick sheet steel.
(8) The vertical lock bar cover shall be removable only when the horizontal cover has been removed.
(9) The emergency release cabinet shall be located at the point of the door.

b. Functions:
(1) The mechanism shall open or close a 600 mm (24") door in not more than five (5) seconds.
(2) Normal force exerted by a door in travel is approximately 5.5N (1.2 lbs). This force shall be field-adjustable by the use of a clutch.
(3) Device shall hold preset pressure on door at all times of operation regardless of voltage setting.
(4) In the event the door is blocked, the door shall automatically continue to the open or closed position when the obstruction is removed.
(5) The locking device shall be designed so that there will be no projecting lugs on the receiving column, or leading edge of door. Door shall automatically deadlock closed at two points at the rear of the door. Door shall also automatically deadlock in the open position.
(6) In the event of power failure, each door shall have capabilities of being unlocked with a #82-6 series lock and paracentric key from either side of door (or as scheduled). This shall enable the door to be moved to the open or closed position. This lock shall be jamb-mounted, and no projecting lugs shall be permitted on the door.
(7) Red and green indicator lights on the control panel will indicate if the door is closed and locked (green) or in the unsecured position (red).
(8) Paint entire assembly, except track rollers and motor mechanism, with rust-inhibitive primer.

26 Remote Controlled Sliding Door Locking Device (special housing inmate cells)

a. Components and Housing:

(1) All motors shall be 1/20 HP, 115 VAC, minimum as manufactured by a nationally recognized manufacturer. This motor shall be protected by a thermal cutout.
(2) Hanger guides shall be 6 mm thick steel plate and shall interlock with track support with a clearance of not more than 6 mm.

(3) Hanger support rollers shall be trimmed from solid steel 95 mm O.D. grooved 9 mm deep. Rollers shall have anti-friction ball bearings with double grease shields. Roller studs shall be high alloy treated steel with eccentric bushing for adjustment of the door.
(4) The horizontal mechanism housing shall be 9mm mild steel plate. Housing covers shall be 3.5mm thick sheet steel with all openings baffled.
(5) The vertical lock bar housing and cover shall be 4.5 mm thick sheet steel.
(6) The vertical lock bar cover shall be removable only when the horizontal cover has been removed.
(7) Provide bottom-hinged housing cover boxes.

b. Functions:

(1) The mechanism shall open or close a 915mm door in not more than 5 seconds.
(2) Normal force exerted by a door in travel is approximately 5.5N. This force shall be field-adjustable by the use of a clutch.
(3) Device shall hold preset pressure on door at all times of operation regardless of voltage setting.
(4) In the event the door is blocked, the door shall automatically continue to the open or closed position when the obstruction is removed.
(5) The locking device shall be designed so that there will be no projecting lugs on the receiving column, or leading edge of door. Door shall automatically deadlock closed at two points at the rear of the door. Door shall also automatically deadlock in the open position.
(6) Provide emergency release at each door by means of a special tool through a slot in the mechanism housing.
(7) Indicator lights on the control panel will indicate if the door is closed and locked or in the unsecured position.
(8) Paint entire assembly, except track rollers and motor mechanism, with rush-inhibitive primer.

B. Miscellaneous Hardware for Security Doors: The following items are scheduled in the security hardware sets:

1. Finish throughout shall be US32D or US26D as scheduled.

2. Closer LCN #4040:
a. Door closers shall be LCN super-smooth series. They shall have fully hydraulic full rack and pinion action with high-strength cast-iron cylinders. Spring power of each closer shall be adjustable. Closer shall have separate adjustments for latch speed, and latch check. They shall have a back check porting adapter. Valve to set cushioning of opening swing in advance of 90-D for standard mounting.

b. Closers shall be mounted to the door with through bolts.
c. All closers shall carry a five (5) year warranty.

3. Door stops shall be Temco #W1273CS for wall mount and Temco #1223WS for floor mount with holder, and Temco #1214WS for floor mount without holder, or equal.
   a. Wall mount bumpers shall mount to the wall in line with the door pull or knob.
   b. Silencers shall be Glynn-Johnson #64 or equal.
   c. Thresholds shall be Pemko #170A or equal.
   d. Weatherstripping shall be mounted on both sides of the jamb and header.

BUILDER'S HARDWARE

A. Furnish builder's hardware and accessories for a complete security system to function properly as specified. Furnish templates of hardware if required by other contractors. Provide security fasteners as specified in Section 11196 SECURITY FASTENERS

INSTALLATION OF HARDWARE AND DOOR LOCK CONTROL SYSTEMS

A. Install hardware in accordance with manufacturer's printed instructions and FBOP policy.

END OF SECTION

SECTION 11199 - SECURITY ACCESS DOORS

GENERAL

A. The access doors provided on this Project are for access into shafts in secure areas. Refer to Section 01000 - SECURE CONSTRUCTION REQUIREMENTS for secure areas.

B. All access doors shall be manufacturer's stock sizes.

C. Include complete schedule, including types, general locations, sizes, construction details, finishes, latching or locking provisions, and other data pertinent to installation.

1. It is desired that the detention equipment subcontractor provide a "turnkey" package with a single source of responsibility for the following sections:
   a. Security Metal Doors and Frames
   b. Detention Hardware
   c. Security Glazing
   d. Detention Equipment
   e. Security Fasteners
   f. Security Access Doors

2. At rated walls, provide access door assemblies with panel door, frame, hinge, and latch from manufacturer listed in Underwriters Laboratories, Inc.'s, *Building Materials Directory* for a "B" classification and at least a 1-hour rating. Provide UL label on each fire-rated access door.

D. Doors shall be flush 10-gauge steel plate with two (2) - No. 3 heavy-duty hinges welded to door and frame, set for open to 125 degrees. Finish shall be phosphate protective coating and factory primer ready for field painting.

1. Similar to Folger Adam No. 416

E. Frames shall be 50 mm x 50 mm x 5 mm (2" x 2" x 0.2") steel angle mitered and welded at corners, ground smooth. Finish shall be the same as doors. Provide anchor straps for masonry or plaster construction as shown on the plans. Provide smoke-resistant gaskets for units in chase walls.

F. Provide 10 series paracentric lever tumbler security lock in each security access door.

G. Fire-Rated Units: Provide insulated flush panel doors, with continuous piano hinge.

END OF SECTION

SECURITY FENCE AND BARBED WIRE REQUIREMENTS

As a minium standard for populations of low security level and above, that contractor shall construct the institution security fence (02820 & 02835) and perimeter security system (17400) in accordance to the attached BOP standards.

SECTION 02820 - SECURITY FENCES AND GATES

PERIMETER SECURITY FENCE

A. The perimeter fence provided for this Project shall enclose the secure area.

B. FABRIC: Polyvinyl chloride (PVC) coated and aluminum chain link fences and gates are not acceptable on FBOP projects. Use only aluminum coated steel wire fabric or steel wire fabric galvanized prior to weaving.

C. END, CORNER AND PULL POSTS:

1. Up to 4.8 m (16'), 102 mm (4") O.D. ,Sch 40
2. Over 4.8 m (16') to 5.5 m (18'), 168 mm (6.625") O.D., Sch 40
3. Over 5.5 m (18') to 6m (20'), 219 mm (8.625") O.D., Sch 40
4. Over 6 m (20'), 219 mm (8.625") O.D.,extra strong pipe, Sch 80

D. LINE (INTERMEDIATE) POSTS:

1. Up to 4.8 m (16'), 73 mm (2.875") O.D., Sch 40
2. Over 4.8 m (16') to 6 m (20'), 102 mm (4") O.D., Sch 40
3. Over 6 m (20'), 168 mm (6.625") O.D., Sch 40

E. TOP, BOTTOM AND INTERMEDIATE RAILS AND BRACES: 42 mm (1.66") diameter.

F. GATE POSTS: For nominal gate width as follows:

1. Up to 1.8 m (6'), 89 mm (3.5") O.D. Sch 40 pipe, but not less than line post size
2. Over 1.8 m (6') to 3.7 m (12'), 168 mm (6.625") O.D. Sch 40 pipe.
3. Over 3.7 m (12') to 5.5 m (18'), 219 mm (8.625") O.D. Sch 40, but not less than end post size.
4. Over 5.5 m (18'), 219 mm (8.625") O.D., extra strong pipe, Sch 80.

G. HINGES: Minimum 4 hinges per leaf.

H. TENSION WIRE: 4.5 mm (0.177") diameter metallic-coated steel.

I. Security fences shall be located 6100 mm (20') apart. Maintain a minimum 30.5 m (100') clear zone between the interior perimeter fence and any building. Taut wire fence shall be located at 1525 mm (5') parallel to the interior perimeter fence, toward the compound side. Taut wire fence shall be used for high security only. Taut wire fence layout at the administration building shall refer to Detail 3 of Drawing SS 5.05, Division 17 Model Documents.

J. TAUT WIRE FENCE POST: 100mm (4") O.D. pipe Sch 40

K. Interior fence angles must be a minimum of 120 degrees except at vehicular sallyport.

L Related work specified elsewhere:

1. Division 2 Sitework.

2. Section 11197 - DETENTION HARDWARE, for hardware.

INTERNAL FENCE (CONTROL FENCE)

A. Internal fences are constructed between housing units and between housing units and adjacent core buildings. These fences are used to isolate the inner compound and restrict inmate movement.

B. If an older specification is being used that references ASTM A 120, change the reference for chain link fence pipe to the new designation ASTM A 53.

C. FABRIC: Polyvinyl chloride (PVC) coated and aluminum chain link fences and gates are not acceptable on FBOP projects. Use only aluminum coated steel wire fabric or steel wire fabric galvanized prior to weaving.

D. HEIGHT. 3660 mm (12').

E. END AND CORNER POSTS: Manufacturer's standard 100 mm (4" diameter).

F. LINE (INTERMEDIATE) POSTS: Manufacturer's standard 73mm (2.875") in diameter.

G TOP RAILS, INTERMEDIATE RAILS, BOTTOM RAILS AND BRACES: Manufacturer's standard 42 mm (1.66") diameter.

H GATE POSTS. For nominal gate width as follows:

1 Up to 1.8 m (6'), minimum 70 mm (2.875") outside diameter pipe; and

2. Over 1.8 m (6'), minimum 100 mm (4") outside diameter pipe.

I. TENSION WIRE: 4.5 mm (0.177") diameter metallic-coated steel.

J. HINGES: Minimum 4 hinges per leave.

REFERENCES

A. ASTM A53 — Standard Specification for Pipe, Steel, Black and Hot Dipped, Zinc-Coated Welded and Seamless (Replaces A 120).

B. ASTM A90 Test Method for Weight of Coating on Zinc-Coated (Galvanized) Iron or Steel Articles.

C. ASTM A153 — Specification for Zinc Coating (Hot Dip) on Iron and Steel Hardware.

D. ASTM A392 — Specification for Zinc-Coated Steel Chain-Link Fence Fabric.

E. ASTM A428 — Standard Specification for Steel, Sheet, for Porcelain Enameling

F. ASTM A446 — Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Structural (Physical) Quality.

G. ASTM A491 — Specification for Aluminum-Coated Steel Chain-Link Fence Fabric.

H. ASTM A569 — Steel, Sheet, and Strip, Carbon (0.15 maximum percent), Hot-Rolled, Commercial Quality.

I. ASTM A653 — Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

J. ASTM A824 — Specification for Metallic-Coated Steel Marcelled Tension Wire for Use with Chain Link Fence.

K. ASTM B117 — Practice for Operating Salt Spray (Fog) Apparatus.

L. ASTM F567 — Standard Practice for Installation of Chain-Link Fence..

M. ASTM F626 — Specification for Fence Fittings.

N. ASTM F900 — Standard specification for Industrial and Commercial Swing Gates.

O. ASTM F1043 — Specification for Strength and Protective Coatings on Metal Industrial Chain-Link Fence Framework.

P. ASTM F1083 — Specification for Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures.

Q. ASTM F1916 — Standard Specifications for Selecting Chain-Link Barrier Systems with Coated Chain-Link Fence Fabric and Round Posts for Detention Applications.

R. Chain Link Fence Manufacturers Institute (CLFMI) — Product Manual.

S. Federal Specification RR-F-191 — Fencing, Wiring, and Post Metal (and Gates. Chain Link Fence Fabric and Accessories).

T. ANSI/ASTM F567 — Practice for Installation of Chain-Link Fence.

U. Standards of Manufacture: Comply with Chain Link Fence Manufacturers Institute (CLFMI) Standards for "Galvanized Chain Link Fence Fabric." and as herein specified, except when aluminized chain link fabric is used.

V. Provide 10-year manufacturer's warranty that the materials supplied shall be free from defects.

PRODUCTS

A. STEEL FABRIC

1. For Perimeter Security Fence

   a. No. 9 gauge steel wires, 50 mm (2") mesh, with top selvage twisted and barbed and bottom selvage twisted and barbed meeting or exceeding the requirements of FGD RR-F-00191/1.
   b. Fabric can not exceed 50 mm (2") deflection under 130N (30 lb) load.

2. For Internal Fence:

   a. Selvage twisted and barbed at top and knuckled at bottom.

3. Provide one-piece fabric widths for fencing or partitions up to 4900 mm (10') high.

B. FINISH FOR FABRIC, FRAMEWORK, AND APPURTENANCES

1. Galvanized finish with not less than minimum weight of zinc per square meter complying with the following:

   a. Fabric: ASTM A392 Class 2, 610 g/m^2 (2 oz/ft^2) zinc, coated before weaving.
   b. Pipe: ASTM A53 and ASTM F1083, 610 g/m^2 (2 oz/ft^2) zinc.

c. Hardware and Accessories: Galvanizing per ASTM A153 (zinc weight per Table I).
d. Wire: ASTM A392, Class 2, 610 g/m² (2 oz/ft²) zinc.

2. Aluminum coating finish conforming to requirements of ASTM A491. The aluminum coating shall be a minimum of 122 g/m² (0.40 oz/ft²) of wire surface. The weight of the coating shall be determined by the strip test as defined in ASTM A428. Fabric shall have a 25-year written warranty against failure due to rust or corrosion. Top and bottom selvages shall be coated with a protective coating to retard formation of rust at cut ends.

C. *FRAMEWORK*

1. Posts, rails, and braces shall conform to Federal Specification RR-F-191/3C Class 1, Grade A or Grade B, and shall meet the following performance criteria when subjected to salt spray testing in accordance with ASTM B117:

a. Exterior — 1,000 hours with maximum 5% red rust.
b. *Interior — 650 hours with maximum 5% red rust.*

2. Steel pipe, Grade A, round, shall be produced to conform with ASTM F1083, standard weight pipe (Schedule 40), or extra strong pipe (Schedule 80) as specified, with a minimum yield strength of 170 MPA (25,000 psi). Steel pipe, Grade B, round, shall be manufactured from steel conforming to ASTM A653, or ASTM 569, cold-formed, high-frequency-welded, *and have a minimum* yield strength of 350 MPA (50,000 psi).

3. Framework Coating: Grade A pipe surface area shall be coated with 550 g/m² (1.8 oz/ft²) of zinc in accordance with ASTM F1083. Grade B pipe exterior surface shall be triple-coated with 300 ±4.5 g/m² (1 ±0.15oz/ft²) of zinc, 5 ±2.5 micrograms/cm² (30 ±15 micrograms/in²) of chromate per square centimeter, and 0.5 ±0.2 mil of clear cross-linked polymer. The interior surface shall have the same zinc and chromate coating as the exterior *and shall have a zinc-rich-based organic coating* having a minimum zinc powder loading of 91% by weight and be capable of providing galvanic protection.

4. Framework Size: The product of the yield strength and the section modulus of Grade B pipe shall not be less than that of Grade A pipe. Posts shall be of the following dimensions and weights:

POST OR RAIL TYPE	OD	Weight Grade A	Weight (kg/m) Grade B
Top, bottom, and intermediate rails, braces	42.2 mm (1.660")	3.4 kg/m (2.27 lb/ft)	2.7 kg/m (1.84 lb/ft)
Line posts			
up to 4.8 m (16')	73 mm (2.875")	8.6 kg/m (5.79 lb/ft)	6.9kg/m (4.64lb/ft)
over 4.8 m (16') to 6 m (20')	101.6 mm (4.0")	13.6 kg/m (9.11 lb/ft)	9.8 kg/m (6.56 lb/ft)
over 6 m (20')	168 mm (6.625")	28.3 kg/m (18.97 lb/ft)	N/A
End, corner, and pull posts			
up to 4.8 m (16')	101.6mm (4.0")	13.6 kg/m (9.11 lb/ft)	9.8 kg/m (6.56 lb/ft)
over 4.8 m (16') to 5.5 m (18')	168 mm (6.625")	28.3 kg/m (18.97 lb/ft)	N/A
over 5.5 m (18') to 6 m (20')	219 mm (8.625")	42.5 kg/m (28.66 lb/ft)	N/A
over 6 m (20')	219 mm (8.625")	64.63 kg/m (43.39 lb/ft)	N/A
Taut wire fence post			
	101.6mm (4.0")	13.6 kg/m (9.11 lb/ft)	9.8 kg/m (6.56 lb/ft)

D. CHAIN LINK GATES

1. Fabrication: Gate panel shall be manufactured with galvanized steel pipe meeting the requirements in specification section C. Gate frame shall be welded to form a rigid panel. Special fittings and rivets will not be approved. Provide vertical and horizontal members to ensure proper gate operation and attachment of fabric, hardware, and accessories. Space frame members a maximum of 2.5 m (8') apart unless otherwise indicated.

   a. Provide same fabric as for fence, unless otherwise indicated. Install fabric with stretcher bars at vertical, top and bottom edges. Attach stretcher bar bands at a minimum of 380 mm (15") on center to secure stretcher bars. Tack weld all nuts and bolts.

   b. Pedestrian Swing Gates. Fabricate perimeter frames in accordance with ASTM F900. Minimum size of perimeter frames members shall be 76 mm (3") OD pipe.

(1) Gate Posts: Furnish posts for supporting one leaf of a single- or double-gate installation.

(2) Hinges: Size and material to suit gate size, non-lift-off ball-and-socket type, offset to permit maximum degree of gate opening. Provide sufficient hinges for each leaf to support gate without excessive sagging, minimum of two pairs of hinges per leaf.

(3) Mounting for Electric Lock: Provide swing gates with mounting for electric gate lock.

(4) Provide gates with mounting for operators and remote electric operation. Operators are specified in 11197 - DETENTION HARDWARE.

c. *Vehicular Gates: Fabricate perimeter frames of minimum 76 mm* (3") OD pipe.

(1) Install fabric with stretcher bars at vertical edges and tie at top and bottom edges. Attach stretcher bars to gate frame at 380 mm (15") o.c. minimum.

(2) Attach hardware with rivets or other means, providing security against removal or breakage.

(3) Gate Frame: As standard with the manufacturer for overhead gate operation and sizes indicated, including (but not limited to) supporting structure, trolley hangers, bottom tracks, guides, support columns, and miscellaneous steel shapes.

(4) Provide gates with mounting for chain drive vehicular gate operators and remote electric operation. Vehicle gate operators are specified in 11197 - DETENTION HARDWARE.

(5) Vehicle Access:

(a) For perimeter security fence:
4.3 m (14') clear width x 4.3 m (14') clear height.

(b) For internal fence, sliding gate at loading docks:
10 m (32.8') clear width x full fence height.

© For internal fence, vehicular swinging gate double leaf between housing units:
4.88 m (16') clear width x full fence height

E. *MISCELLANEOUS MATERIALS*

1. Tie wires shall be produced from a 9-gauge steel core wire with either a galvanized coating (240 g zinc coating per square meter) or aluminum coating (122 g aluminum per square meter). Aluminum wire shall not be used. Coating of tie shall be the same type as fence fabric.

2. Concrete: 21 MPA (3000 psi) as specified in 03050 - BASIC CONCRETE *MATERIALS AND METHODS*, unless otherwise noted.

3. Galvanizing Touch-Up Paint: Where galvanizing is damaged by welding or other means, touch up paint with "Galv-Weld" by Galv-Weld Products, or approved equal.

4. Provide all other materials not specifically described but required for a complete and proper installation of the work of this section. Materials shall be new, first-quality of their respective kinds.

5. Tension and Brace Bands: All bands shall be beveled 12-gauge galvanized steel. Galvanized coating shall meet specification section B. and C. above.

EXECUTION

A. FABRICATION

1. Coordination fabrication to receive security locking and operating devices in accordance with manufacturer's written instructions.

2. Fabricate material and components in the shop, to the greatest extent possible. Galvanize components after fabrication.

3. Provide welded corners at gate panels and other frame assemblies.

B. INSPECTION

1. Surface Conditions: Prior to all work of this section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.

2. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

C. SITE PREPARATION

1. Stake out fence lines and terminal post locations.

2. Underground utilities shall be installed prior to starting construction.

3. All clearing and grading for the fence lines shall be performed before installation begins.

D. INSTALLATION

1. General: Install work of this section in accordance with the manufacturer's recommendations as approved by the Contracting Officer and in accordance with ANSI/ASTM F567.

2. The fence shall follow line of finished grade, unless otherwise indicated.

3. Post Locations: Double fence rows to be set 6100 mm (20') apart. Line posts will be spaced equal distances and at intervals not exceeding 3050 mm (10'). Terminal posts will be set at the beginning and end of each continuous length of fence, with a maximum spacing of 150 m (500') and at abrupt changes in vertical or horizontal alignment. Extend posts 1200 mm (4') / 2000 mm (6'-6") above fabric at vehicular sallyport for supporting barbed tape. Taut wire posts will be also spaced equal distances and at intervals not exceeding 3050 mm (10').

4. Post Footings: Dig or drill post hole footings in the line of fence and taut wire fence. Set posts in vertical position and in line. Pour footings with 21 MPA (3000 psi) minimum strength concrete. Size of footings shall conform to the sizes shown. Concrete shall be thoroughly worked into the footing so as to leave no voids and will be allowed to cure a minimum of 7 days before installing fence fabric or other components.

   a. When solid rock is encountered, set posts in the solid rock. The depth of the hole shall be three times the diameter of the post. The diameter of the hole shall be 13 mm (½") greater than the diameter of the post. Half-fill the void with non-shrink grout and force the post to the bottom of the hole and plumb. Work additional grout into hole so as to leave no voids. Crown the grout to shed water.

   b. When solid rock is covered by soil or loose rock, set the posts to the full depth unless the penetration into solid rock reaches the minimum depth specified above, in which case terminate the depth of penetration. Construct footing from solid rock to 50 mm (2") below finished grade. Grout the portion of post in solid rock.

   c. After installation, all fence posts shall pass the following tension test: Apply a force of 222 N (50 lbs) perpendicular to the direction of the fence at the top of each post. The post should not deflect more than 25 mm (1") at the location where the force is applied.

5. Terminal Post Bracing: Fences shall have braces at all terminals. Brace *corner, end, and pull posts to adjacent line post with horizontal center rail* and diagonal truss rods.

6. Top and Bottom Rails: Run top rails continuously through line post caps. Support the top and bottom rails at each post so that a continuous brace from end to end of each stretch of fence is formed. Securely fasten the top and bottom rails to the terminal posts and splice with sleeves or *expansion couplings.*

7. Intermediate Rails: Install intermediate rails midway between the top of the fence fabric and bottom rails. Connect intermediate rail to terminal and line posts with 40 mm (1-5/8") boulevard bands. Attachment bolts for bands shall be carriage bolts with nuts (end of bolts shall be peened). Fence fabric shall be secured to *intermediate and bottom rail* with galvanized steel wire woven through fence fabric, completely around the rails, and the wire will be twisted three twists on the rail side of fence and the tails of the wire cut off to preclude untwisting by hand. Provide intermediate rail at the top of fabric at the vehicular sallyport.

8. Fabric: Leave approximately *25 mm (1") between concrete slab or finish* grade and bottom selvage and 50 mm (2") between top selvage and overhead structure. Install fabric on security side or institution side of fence, and anchor to framework so that fabric remains in tension after pulling force is released. Stretch fabric to the point where maximum deflection at the center of the panel does not exceed 50 mm (2") under 133 N (30 lbs). Maintain tension by securing stretcher bars to posts with *metal bands spaced 380 mm (15")* o.c. maximum. Fasten fabric to framework with wire ties, spaced 300 mm (12") o.c. maximum for all posts, rails, braces, and tension wires. Tighten all fasteners securely, eliminating fabric movement across framework.

9. Stretcher Bars: Thread through or clamp to fabric 100 mm (4") o.c., and secure to posts with *metal bands spaced not over 380 mm (15") o.c.*

10. Gates: Install gates plumb, level, and secure for full opening without interference. Adjust hardware for smooth operation and lubricate.

11. Fasteners: Install nuts for tension bands and hardware bolts on side of fence opposite fabric side. *Spot-weld nuts to bolts in position to prevent* removal. Touch up damaged galvanized finish as required.

12. Post and Line Caps: Provide weather tight closure cap for each post.

13. Grounding: Fence fabric shall be grounded at a maximum of 30 m (100') intervals by attaching both fence fabrics at ground level to a 16 mm (5/8") diameter, 3 m (10') long copper-clad grounding rod. Drive the rod into the ground between fences leaving 150 mm (6") above grade. Connect the rod above ground to a #8 copper wire running to each fence. At each fence, run the #8 wire up the fabric 450 mm (18") and connect the #8 wire to the fabric with a straight copper cadweld connection. Install at all perimeter security and control fences and other areas determined by FBOP where necessary for lighting protection.

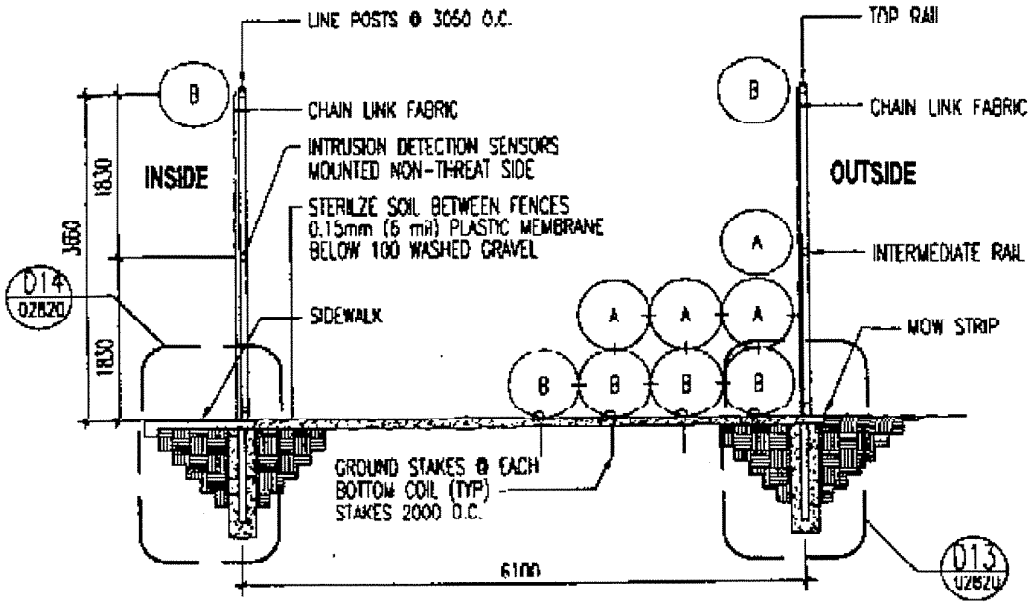
14. The following standard drawings and/or details are provided as examples of how the requirements for this section can be met. These or other drawings approved by FBOP shall be included in the contract documents for the project.

SCHEDULE OF DRAWINGS

02820-D1	TYPICAL SECTION LOW & MEDIUM SECURITY PERIMETER FENCE
02820-D3	CORNER P OR END POST
02820-D4	VEHICULAR SALLYPORT PLAN - LOW & MEDIUM SECURITY
02820-D6	SLIDING VEHICLE GATE
02820-D7/D7A	TYPICAL FENCE SECTION @ VEHICULAR SALLYPORT - LOW & MEDIUM SECURITY
02820-D9	ANTI-CRASH GATE PLAN
02820-D10	ANTI-CRASH GATE DETAIL
02820-D11	LOCK PIN DETAIL
02820-D12	GATE ARM MOUNTING DETAIL
02820-D13	TYPICAL EXTERIOR FOUNDATION PERIMETER SECURITY FENCE
02820-D14/D14A/D14B	TYPICAL INTERIOR FOUNDATION PERIMETER SECURITY FENCE
02820-D16	TYPICAL FENCE SECTION @ VEHICULAR SALLYPORT - LOW & MEDIUM SECURITY
02820-D18	TYPICAL FENCE SECTION @ VEHICULAR SALLYPORT LOW & MEDIUM SECURITY
02820-D20	BARBED TAPE WIRE DETAIL
02820-D21	TYPICAL ELEVATION @ CONTROL FENCE - LOW & MEDIUM SECURITY (Intersection of Control Fence to Perimeter Fence)
02820-D22	TYPICAL SECTION @ CONTROL FENCE - LOW & MEDIUM SECURITY

END OF SECTION

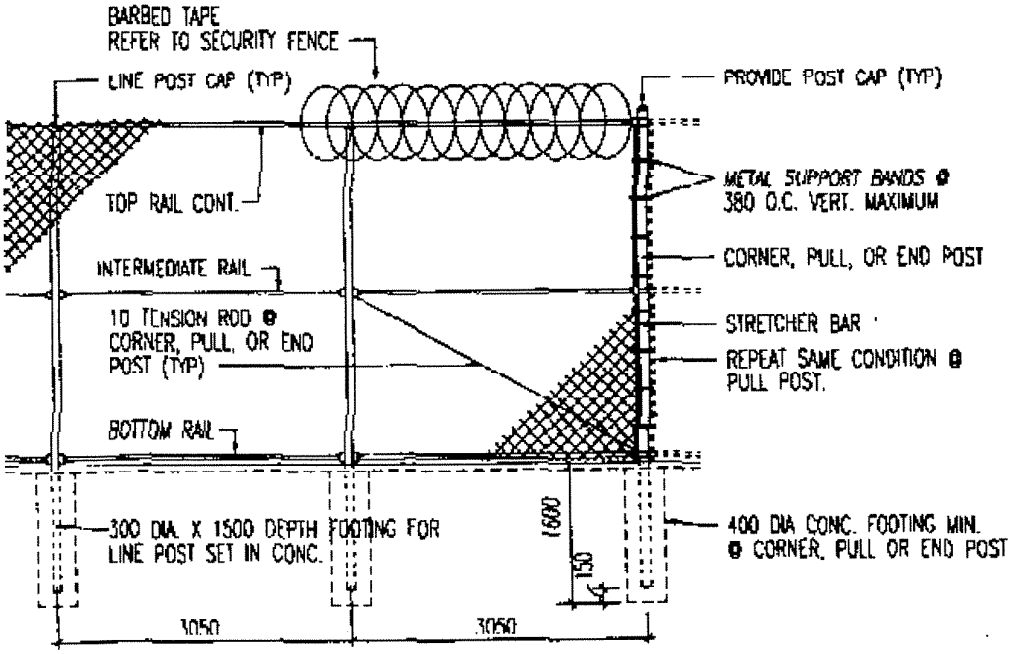
SECURITY COILS
A - 750 DIAMETER BARBED TAPE NON-REINFORCED
B - 750 DIAMETER BARBED TAPE WIRE-REINFORCED



ALL DIMENSIONS ARE MILLIMETERS (mm) UNLESS OTHERWISE NOTED.

PERIMETER SECURITY FENCE LOW & MEDIUM SECURITY - TYPICAL SECTION

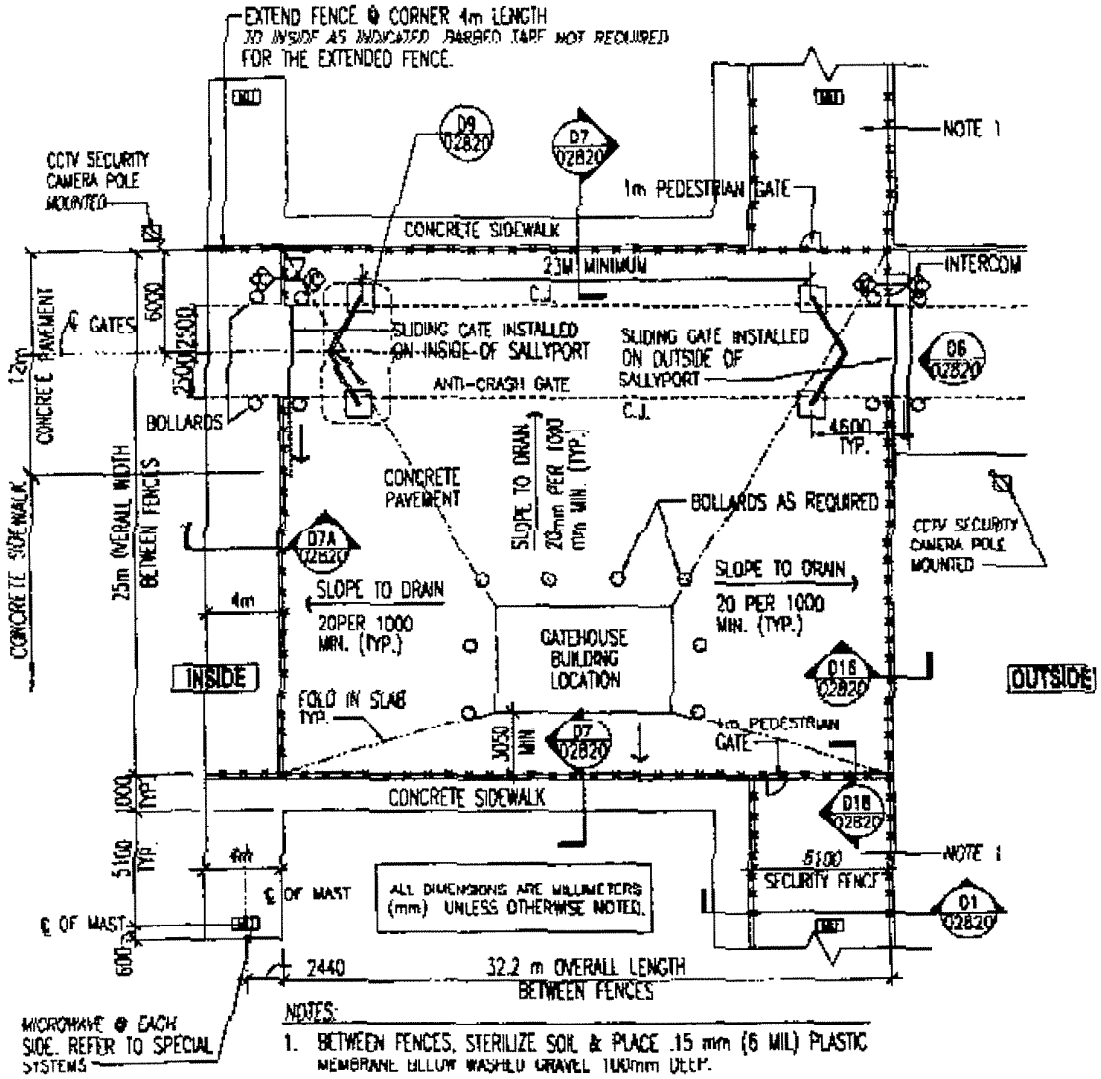
N.T.S.



ALL DIMENSIONS ARE MILLIMETERS (mm) UNLESS OTHERWISE NOTED.

CORNER PULL OR END POST

N.T.S.

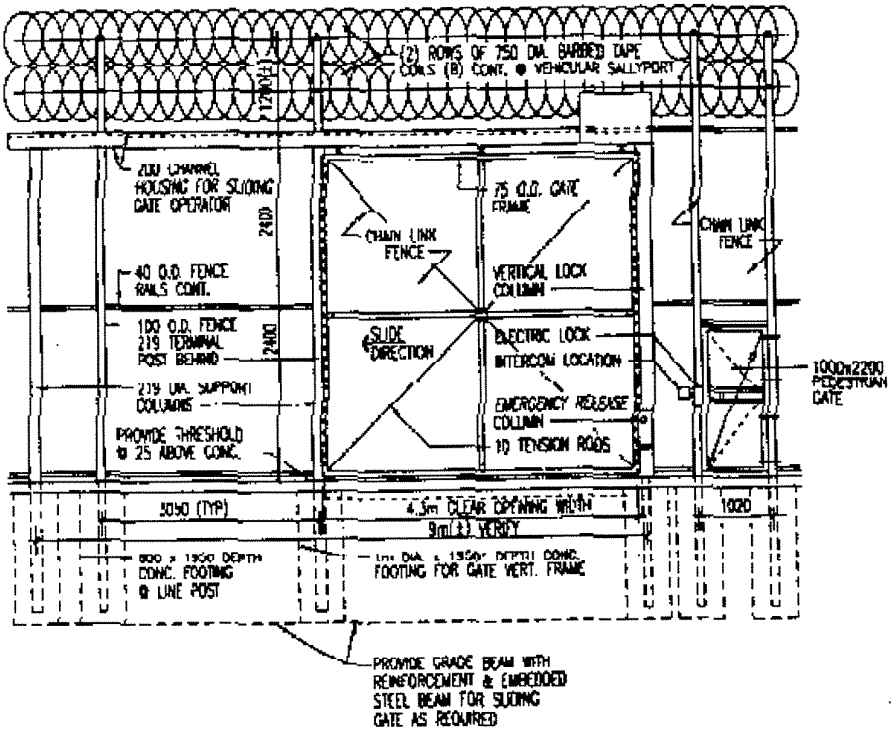


NOTES:

1. BETWEEN FENCES, STERILIZE SOIL & PLACE .15 mm (6 MIL) PLASTIC MEMBRANE BELOW WASHED GRAVEL 100mm DEEP.
2. CONSTRUCTION JOINT FOR SALLYPORT PAVEMENT SHALL BE AT APPROX. 3000mm O.C. EACH WAY U.N.O.
3. CONSTRUCTION JOINT FOR CONC. WALK, REFER TO 02820-D7.

VEHICULAR SALLYPORT PLAN LOW & MEDIUM SECURITY

N.T.S.



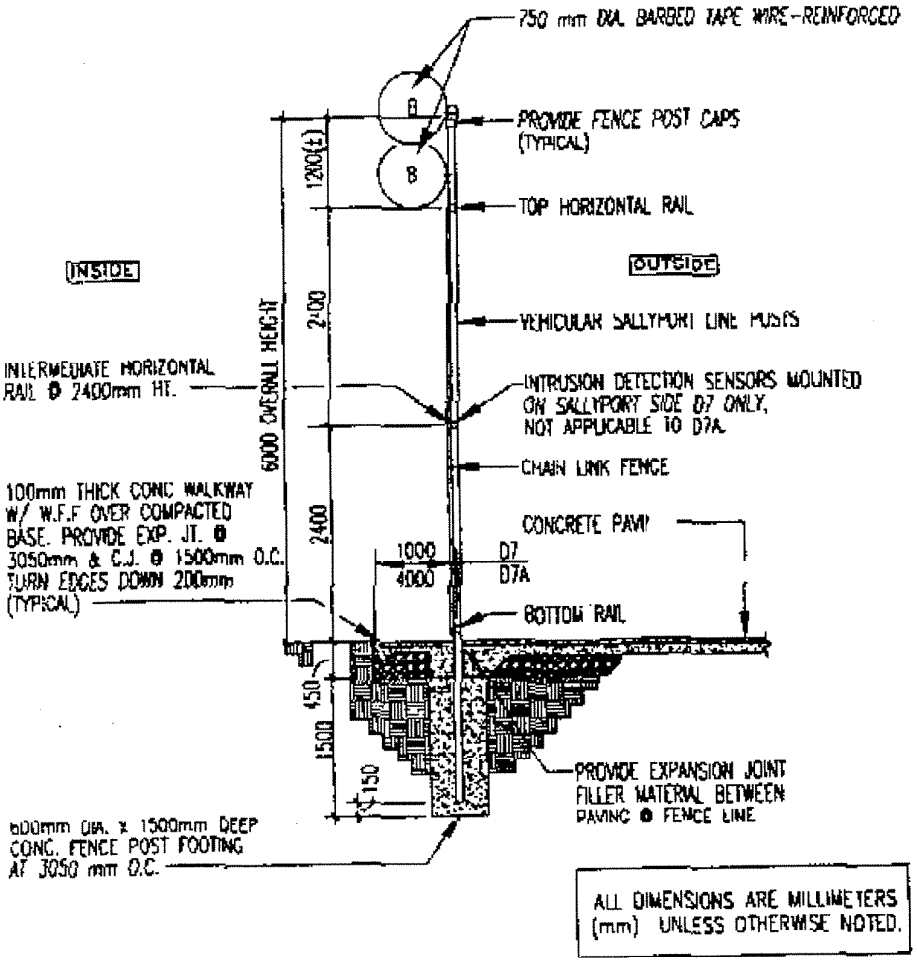
NOTES:

1. * MINIMUM DEPTH BELOW TOP OF CONCRETE PAVING

ALL DIMENSIONS ARE MILLIMETERS (mm) UNLESS OTHERWISE NOTED.

SLIDING VEHICLE GATE

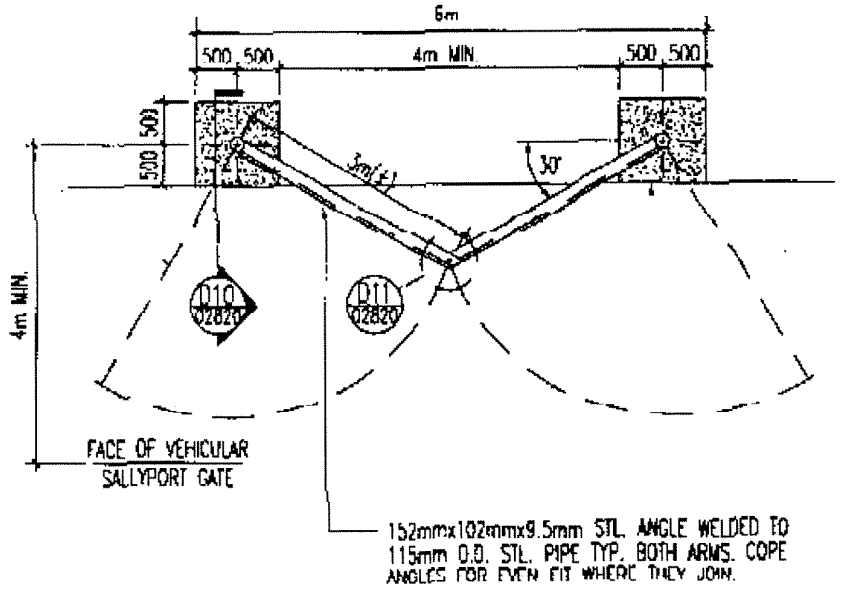
N.T.S.



TYPICAL FENCE SECTION @ VEHICULAR SALLY PORT - LOW AND MEDIUM SECURITY

N.T.S.

ALL DIMENSIONS ARE MILLIMETERS (mm) UNLESS OTHERWISE NOTED.



ANTICRASH GATE PLAN

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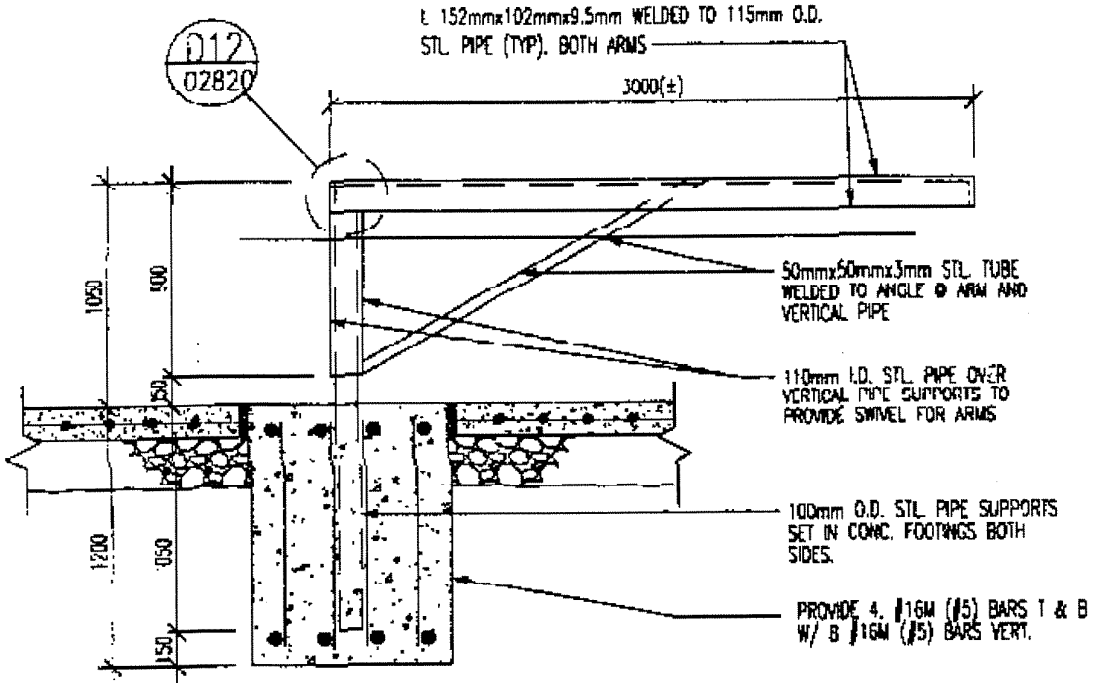

ALL DIMENSIONS ARE MILLIMETERS (mm) UNLESS OTHERWISE NOTED.

ANTICRASH GATE DETAIL

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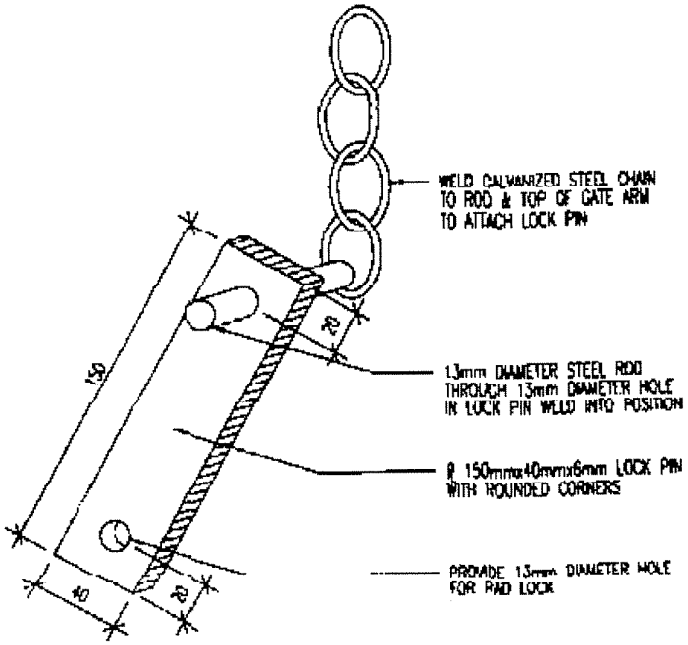

ALL DIMENSIONS ARE MILLIMETERS (mm) UNLESS OTHERWISE NOTED.

LOCK PIN DETAIL

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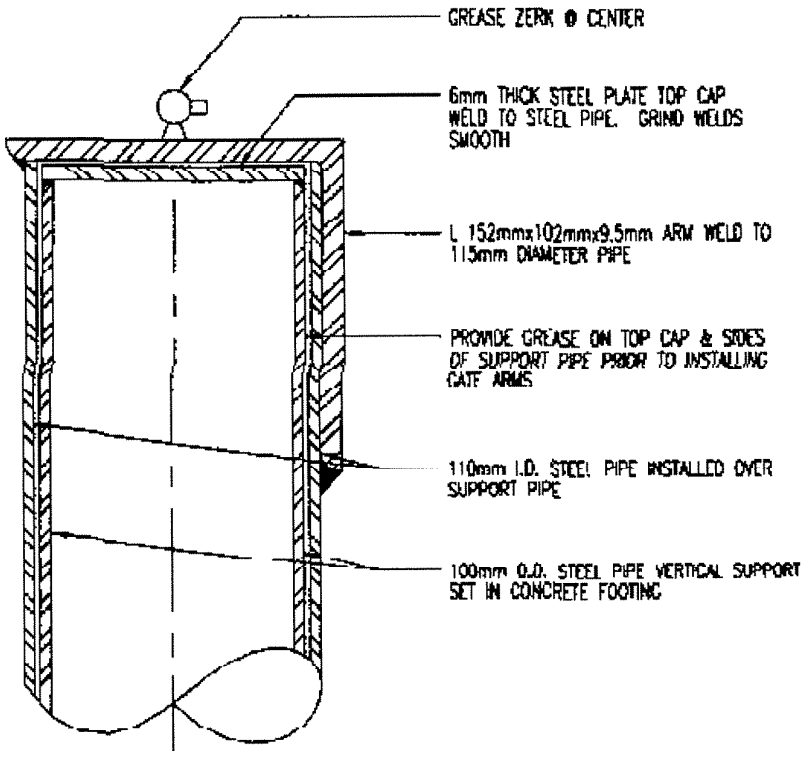

GATE ARM MOUNTING DETAIL

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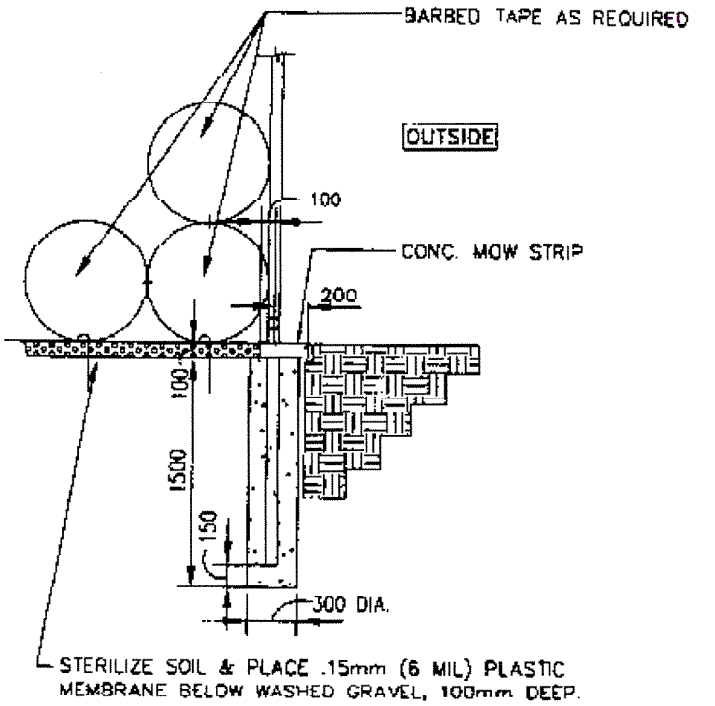

ALL DIMENSIONS ARE MILLIMETERS (mm) UNLESS OTHERWISE NOTED.

TYPICAL EXTERIOR FOUNDATION PERIMETER SECURITY FENCE

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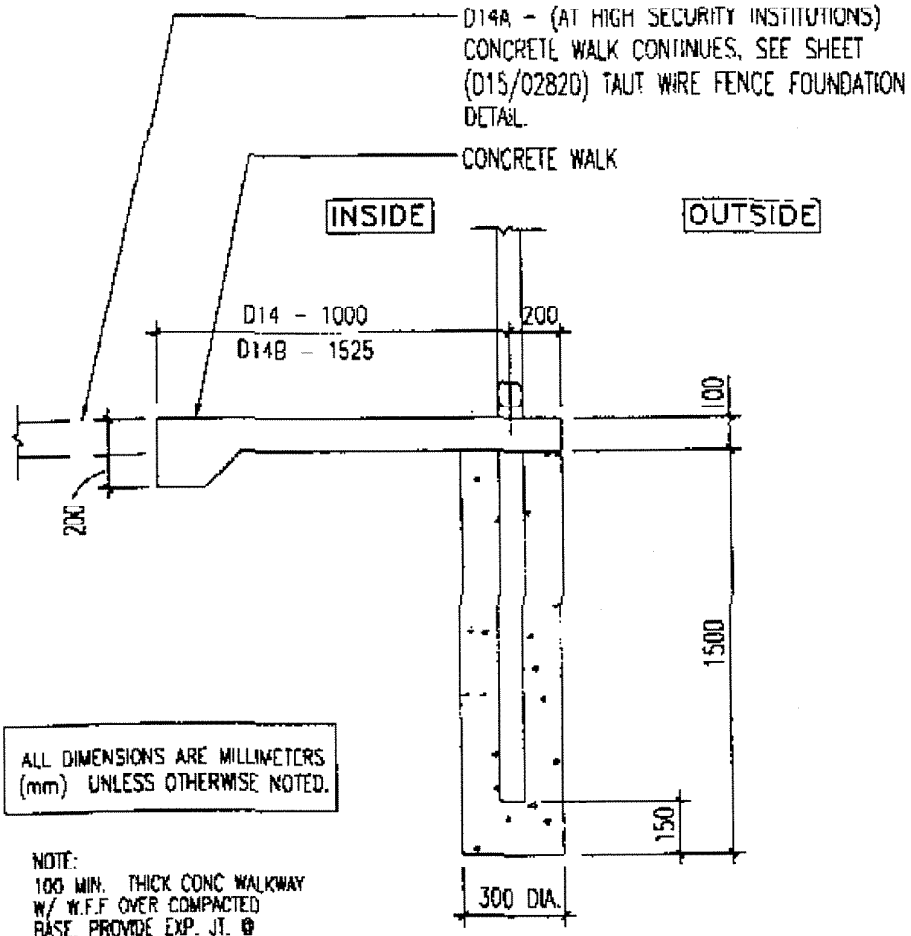

TYPICAL INTERIOR FOUNDATION PERIMETER SECURITY FENCE

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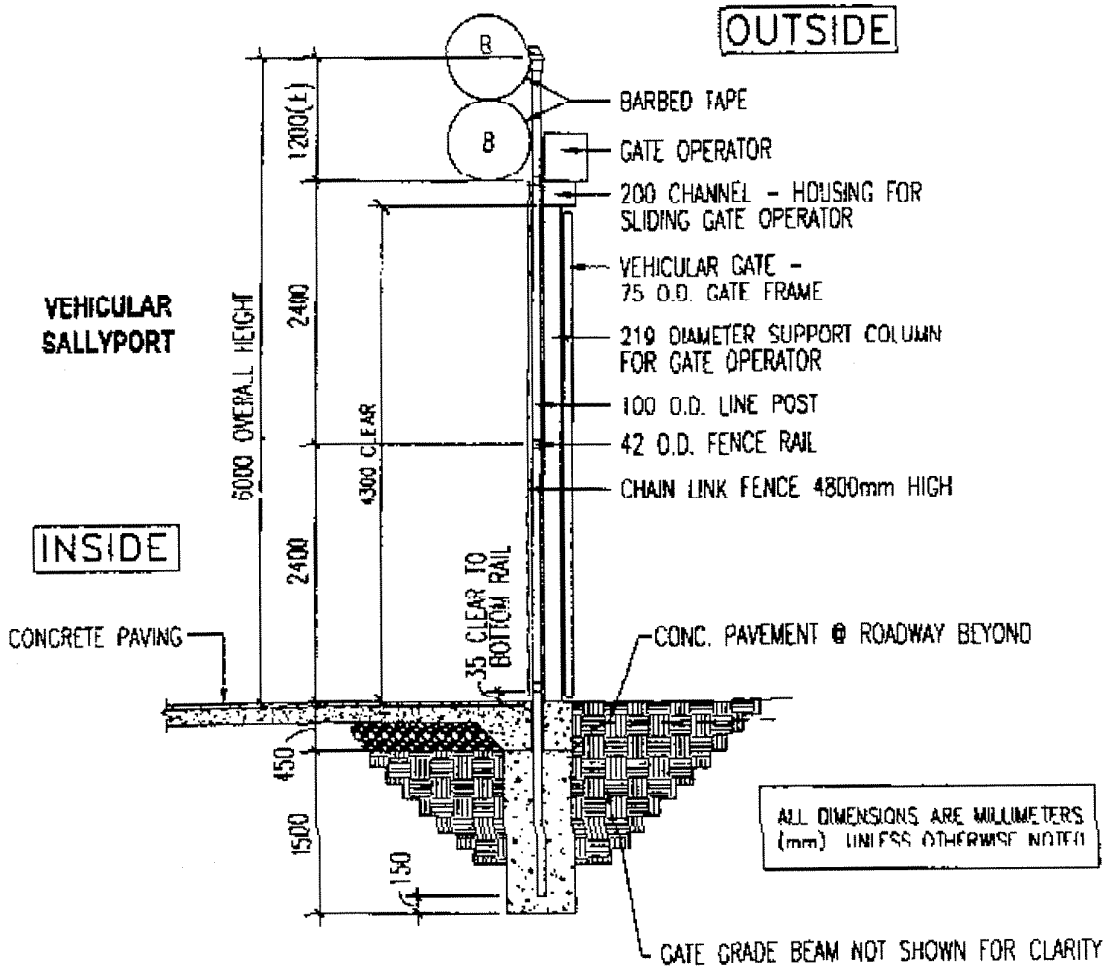
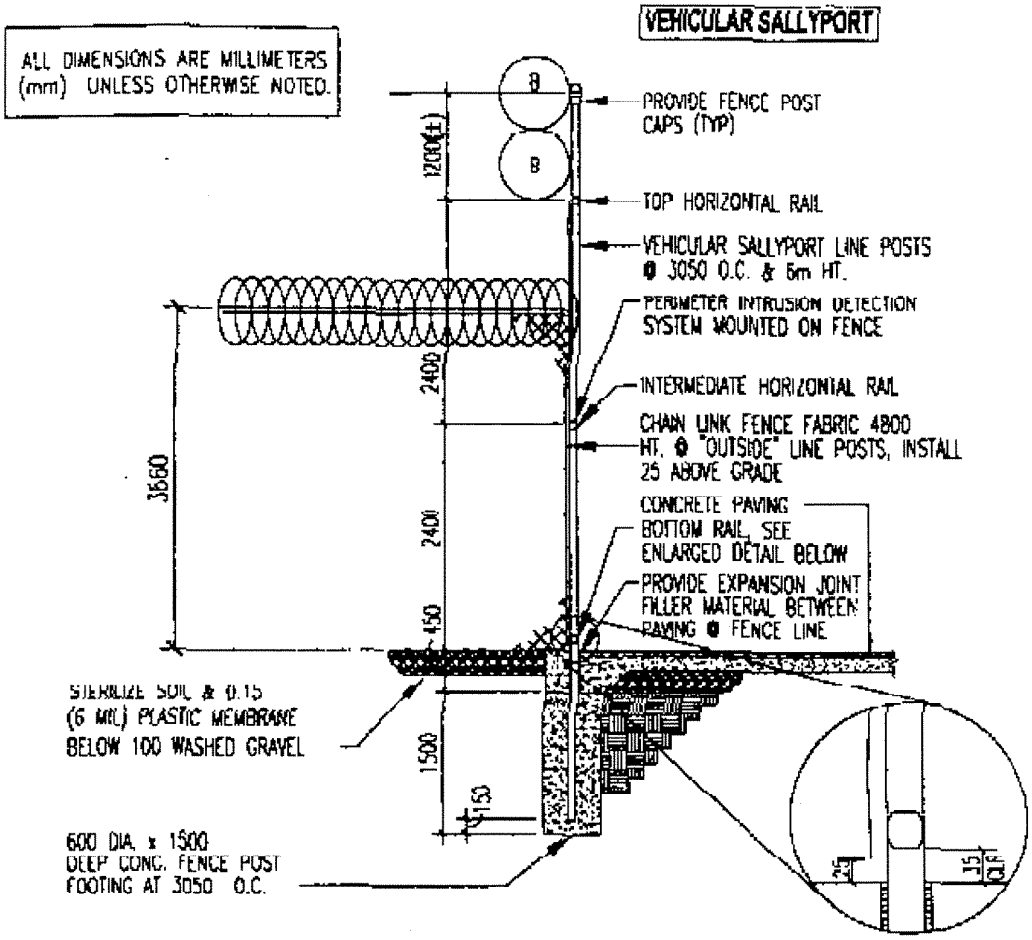


TYPICAL FENCE SECTION @ VEHICULAR SALLYPORT - LOW AND MEDIUM SECURITY

N.T.S.



TYPICAL FENCE SECTION @ VEHICULAR SALLYPORT - LOW & MEDIUM SECURITY

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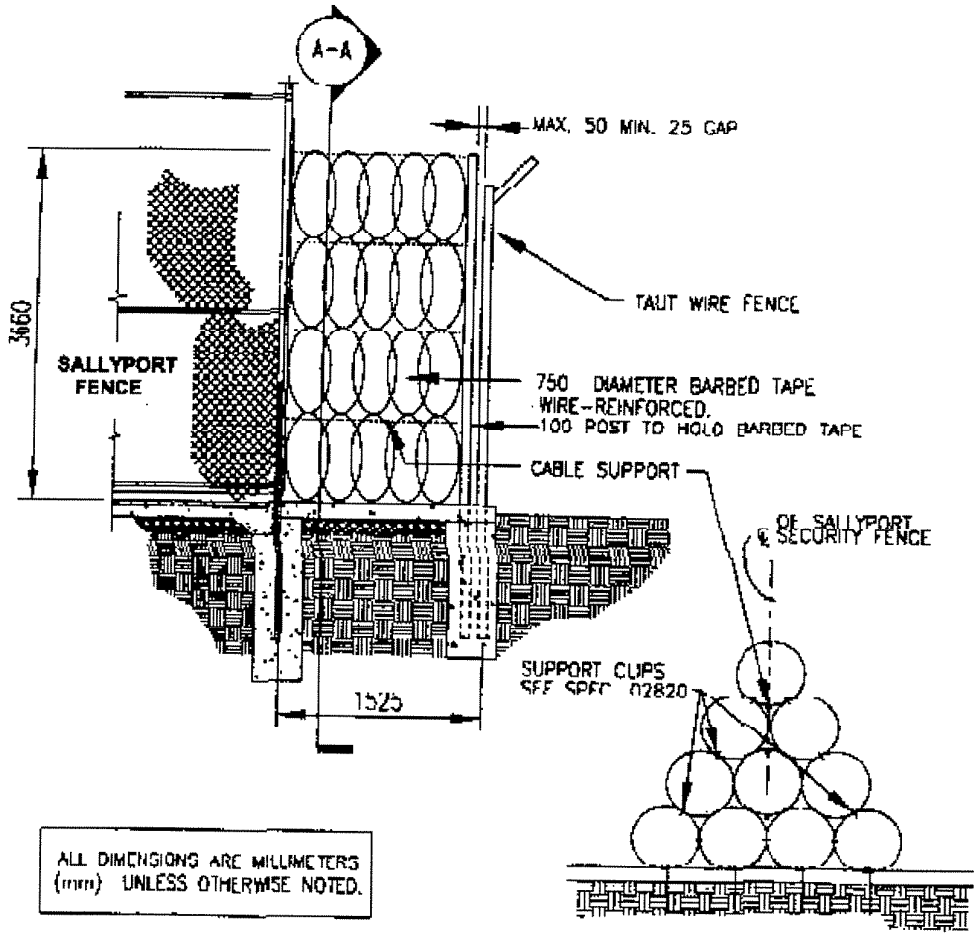
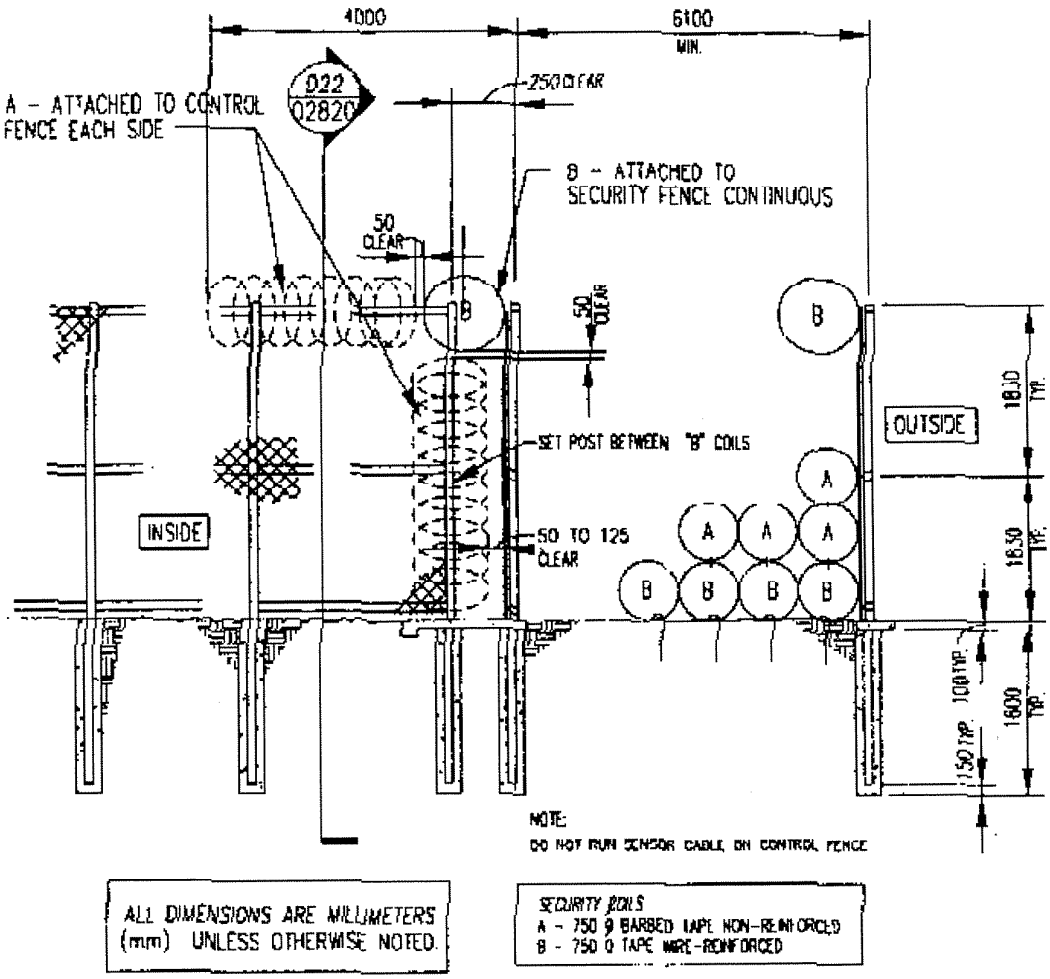


SECTION A-A

N.T.S.

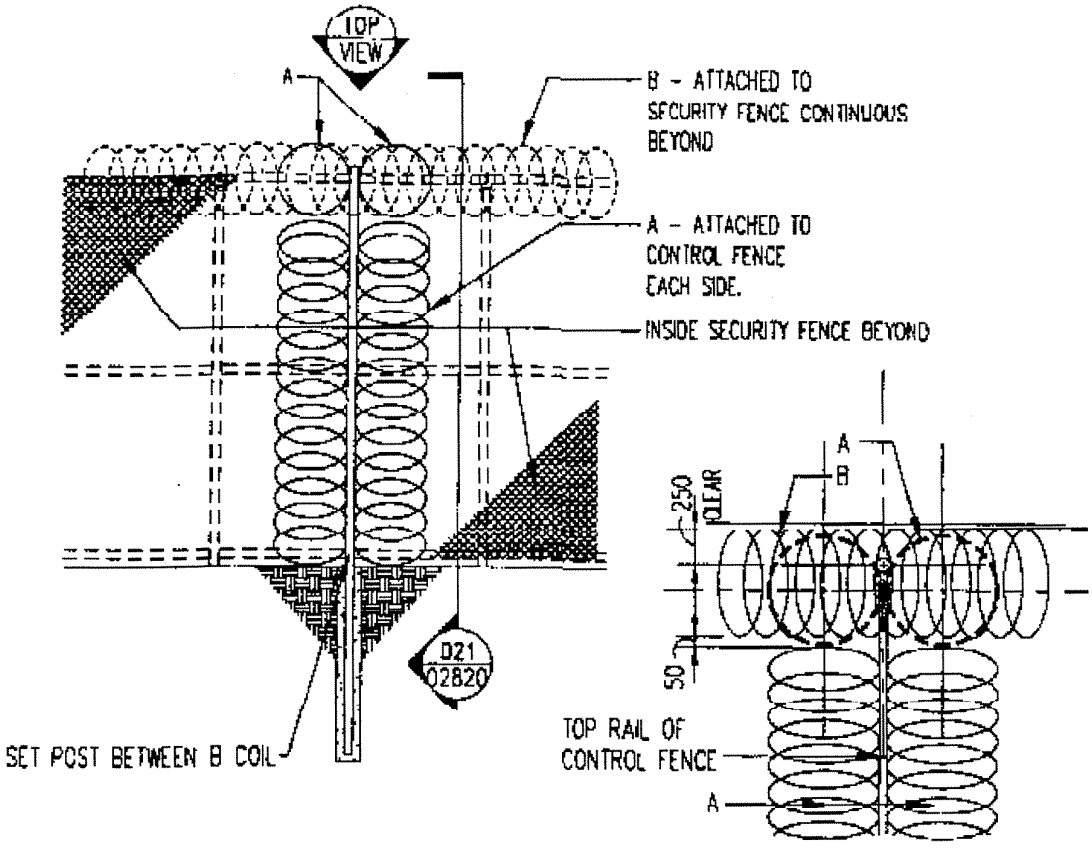
BARBED TAPE WIRE DETAIL

N.T.S.



TYPICAL SECTION @ CONTROL FENCE - LOW & MEDIUM SECURITY

N. T. S.



TOP VIEW

N.T.S.

TYPICAL SECTION @ CONTROL FENCE - LOW & MEDIUM SECURITY

N.T.S.

SECTION 02835 - BARBED TAPE

PART 1 - GENERAL

1.1 SUMMARY

A. This section includes barbed tape barrier to be installed with perimeter security fence.

B. The barbed tape will be provided by the Government, to be installed by the Contractor

1.2 REFERENCES

A. ASTM A 478 - Standard Specification for Chromium-Nickel Stainless and Heat-Resisting Steel Weaving and Knitting Wire.

B. ASTM A 585 - Standard Specification for Aluminum-Coated Steel Barbed Wire.

1.3 SUBMITTALS

A. Product Data - Include manufacturers' data, specifications and installation instructions for all components, materials and accessories.

B. Shop Drawings - Include layout indicating plan, section and details illustrating layout and arrangement and erection procedures as per recommendation by manufacturer.

PART 2 - PRODUCTS

2.1 NON-REINFORCED BARBED TAPE

A. Barbed tape coils shall be 750 mm (30") in diameter. Tape shall be fabricated from spring quality austenitic stainless steel, minimum hardness of Rockwell (30 N) 50-55, nominal 6 mm (0.24") thick, nominal 30 mm (1.210") width prior to fabrication Clusters of four barbs having a maximum tip radius of 0.127 mm(0.005") shall be punched 100 mm (4") on center. Barb cluster width shall be 30 mm. Barb clusters shall have a minimum length of 30 mm (1.2"). Barb shall be alternately offset from the tape center line 4 - 12 mm (0.15"-0.45") Adjacent coiled loops shall be alternately clipped together or spot welded at five points of approximately equal radius spacing about the coil loop perimeter. Clips shall survive a 890N (200 lb.) force loaded uniformly about the periphery of the coil. Welded attachments shall withstand a minimum pure tensile circumference preventing any slippage of one past another at the point of attachment. Clips shall be

fabricated from approximately 2 x 7 mm (0.065"x0.275") stainless steel. The 750 mm (30") diameter coils and five point uniform radial connections shall interact to produce a concertina coil with a 300 mm (12") opening between adjacent coil loops.

2.2 WIRE-REINFORCED BARBED TAPE

A. Barbed Tape Coils shall be 750 mm (30") in diameter. Tape shall be fabricated for ASTM 478 Stainless Steel strip hardened to Rockwell (30 N) 40-50, 6 mm(0.24") thick, 25 mm (1") width prior to roll forming. Clusters of 4 barbs having a maximum tip radius of 0.127 mm (0.005 inch) shall be punched 100 mm(4") on center. Barb clusters shall have a minimum length of 30 mm (1.2"). Barbs shall be alternately offset from the tape center line 4 - 12 mm (0.15"-0.45"). The stainless steel strip shall be permanently cold clenched around a 2.5 mm (0.098") diameter austenitic stainless core wire having a minimum tensile strength of 895 MPa (130 ksi). The barbed tape shall have a minimum 230 degree wrap about the core wire. Concertina clips placed around the circumference of the tape shall be such that adjacent loop's are rigidly fixed, preventing any slipping of the past another at the point of attachment. Clips shall be fabricated from 1.6 x 9.5 mm (0.065"x0.375") stainless steel and capable of withstanding a pull of 890N (200 lb.)

2.3 INSTALLATION TIES

A The Contractor shall use one of the following methods:

1. Wire Ties used to attach security coils to the fences shall be austenitic stainless steel, 175 mm (±25 mm long), [(7" ±1" long)], 1.2 mm (18 gauge) thick, twistable ties. No less than three ties shall be used for each 300 mm (1 ft) of installed length of barbed tape used. The wire shall have 3 complete twists.

2. "Hog Rings" used to attach security coils to the fences shall be 13 gauge stainless steel and shall be used to fasten barbed tape to chain link fabric, tension wire, and barbed tape. No less than three "hog rings" shall be used for each 300 mm (1 ft) of installed length of barbed tape

2.4 GROUND STAKES

A. Ground stakes will be #10M (#3) galvanized reinforcing rods 450 mm (± 25 mm) [(18" ±1")] long with a 180° end hook 125 mm (5") in length

2.5 BARBED WIRE

A. Barbed wire shall be two-strand, 3 mm (0.12") thick, Class 3, meeting the requirements of ASTM A585. Barbs shall be four-point 2.5 mm (0.1") thick

aluminized wire interwoven and spaced 100 (4") to 150 mm (6") apart

PART 3 - EXECUTION

3.1 INSPECTION

A. Surface Conditions - Prior to work of this Section, carefully inspect the installed work of other trades and verify that such work is complete to the point where this installation may properly commence.

B. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

C. Proceed with work following placement of herbicide and gravel between security fences.

3.2 INSTALLATION

A. General - Install work of this Section in accordance with the manufacturer's recommendations as approved by the Contracting Officer.

B. Drive ground stakes to a depth of 300 mm (12") at ends of each roll and at 3600 mm (12') o.c. maximum between ends. Connect ground stake to bottom of each roll with stainless steel wire ties.

C. Attach rolls to security fencing with stainless steel wire ties at 300 mm (12") o.c. Install high rolls to ensure rolls do not bounce in the wind. Add additional ties as necessary.

D. Attach ends of rolls to each other with stainless steel wire ties at a minimum of 5 points around the perimeter circumference of the roll. Attach points shall correspond to attachment points within the roll. Rolls that are not supported by either ground stakes or security fencing shall be attached to adjacent rolls, next to, underneath and above at a minimum of 1200 mm (4') o.c.

3.3 INSPECTION

A. The completed installation shall be inspected and approved by an authorized manufacturer's representative. Provide a certificate of compliance to the Contracting Officer indicating the installation meets or exceeds the manufacturer's written requirements for the application shown. Correct improperly installed work.

END OF SECTION

SECTION 17400 - PERIMETER SECURITY SYSTEM

PART 1 - GENERAL

1.4 SYSTEMS DESCRIPTION:

A. Fence System:

1. The perimeter security system shall include the following:

a. A fence mounted electronic sensor to sense fence disturbances associated with an attempted breach of security. Sensors shall be configured in zones as shown on the drawings.

b. A microwave sensor system shall be installed at the vehicle sally port as shown on the drawings.

c. Monitoring and control system to monitor all sensors using time division multiplexed technology. Monitoring and control system shall include remote multiplex units for interfacing alarm sensors, communication system, and an operator terminal with event *logging printer.*

d. The Monitor, Control, and Display system to provide the following features.

1) Annunciate alarms on a per zone basis. An alarm shall be annunciated both visually and audibly

2) Acknowledging alarm event shall silence the audible alarm.

3) Each zone may be placed in the "Access" mode which inhibits an alarm event for the selected zone.

4) Each zone may be placed in the "Secure" mode which removes the zone from the "Access" mode.

5) After receipt of an alarm and conditions have returned to normal, each zone may be "secured" which returns the zone to a normal operating condition.

6) Each zone may be monitored to listen to the audio signal generated by the fence mounted detection system.

7) Continuously supervise all lines and report to the operator terminal if the integrity of the system is compromised.

e. A graphic annunciator to be mounted in the Central Control Console to annunciate the status of all zones.

2. Fence sensors shall be powered from power supplies located in the admin building security equipment room. Microwave sensors shall be powered from power supplies located the vehicle sally port building equipment room. Power supplies shall be powered from an uninterruptible power source.

3. All signal and power lines entering each Perimeter Security Enclosure (PSE) or Security and Communications Cabinet (SCC) shall be protected with surge protectors.

4. All signal lines reporting the status of a perimeter sensor shall be supervised.

END OF SECTION

PART 2 - PRODUCTS